HPE aruba networking

Simplify and accelerate your VMware environment with HPE Aruba Networking Fabric Composer

HPE GreenLake

Introduction

HPE Aruba Networking Fabric Composer is an intelligent, application programming interface (API)-driven, software-defined orchestration solution. It simplifies and accelerates data center network provisioning across physical and virtual rack-scale compute and storage infrastructure environments.

What makes HPE Aruba Networking Fabric Composer different from other solutions is its ability to orchestrate a discrete set of switches as a single networking fabric in order to simplify operations and troubleshooting. This infrastructure- and application-aware solution also automates various configuration and lifecycle events.

HPE Aruba Networking Fabric Composer supports deep IT ecosystem integrations, allowing administrators to manage, provision, and visualize their entire end-to-end network. An intuitive HTML5-based user interface provides a self-documenting real-time map of the environment: from a virtual machine (VM), to host networking, to a specific switch port, and through a network view, visualizing virtual switch and spine-leaf connectivity. A robust set of APIs and tight integration into many third-party data center automation provide a seamless configuration and operational experience.

Deep integration with VMware

The integration of HPE Aruba Networking Fabric Composer with VMware vSphere® can discover and visualize the virtual network infrastructure both within hosts and with the physical network infrastructure those hosts are connected to. In addition, HPE Aruba Networking Fabric Composer can respond to VM lifecycle events and configuration changes, making appropriate fabric adjustments automatically. VM administrators can manage fabric operations all from a single VMware® console—a powerful, simplified operating model that most administrators have seldom before had access to.

HPE Aruba Networking Fabric Composer offers customers prebuilt, fully-tested integrations for both VMware vSphere and VMware NSX® Manager™ so administrators can automate everyday network operations and dramatically improve visibility into network and host configuration details. It can be managed directly from the vSphere management interface, simplifying administration and troubleshooting.

In addition, HPE Aruba Networking Fabric Composer integrates the network's physical datapath and control paths with the VMware NSX® layer, creating a truly synchronous physical and virtual network experience.

Integration benefits

- Is simple and straightforward
- Reduces complexity, operating costs, and time to value for VMware deployments
- Delivers full network automation and awareness of lifecycle events
- Provides storage workload traffic optimization
- Scales non-disruptively from single-rack deployments to cloud-scale deployments with equal ease
- Provides unprecedented visualizations and improved troubleshooting

VMware integration detail

The seamless integration of HPE Aruba Networking Fabric Composer with VMware is achieved through associated VMware integration, which contains specific logic and interfaces to VMware.

This prepackaged, pretested, and fully supported VMware integration lets HPE Aruba Networking Fabric Composer automatically discover managed elements (such as physical nodes, VMs, VLANs, link aggregation group [LAGs], and VMkernel adapters) in the VMware environment.

It also provides workflows to automate operations—such as dynamic network provisioning for VM lifecycle events and storage path optimization—all managed through vSphere.

The VMware integration also allows HPE Aruba Networking Fabric Composer to discover VMware nodes automatically and to reprovision the network fabric dynamically, all in response to VMware compute and storage events. This action enables high network performance and service quality for diverse applications and workloads while making optimal use of network capacity.

HPE Aruba Networking Fabric Composer gives VMware customers the benefits of automation and network path control across three functional areas:

- Configuration
- Operations and management
- Network virtualization through NSX

With these capabilities, VMware customers enjoy reduced complexity, lower operational costs, and fast time to value.

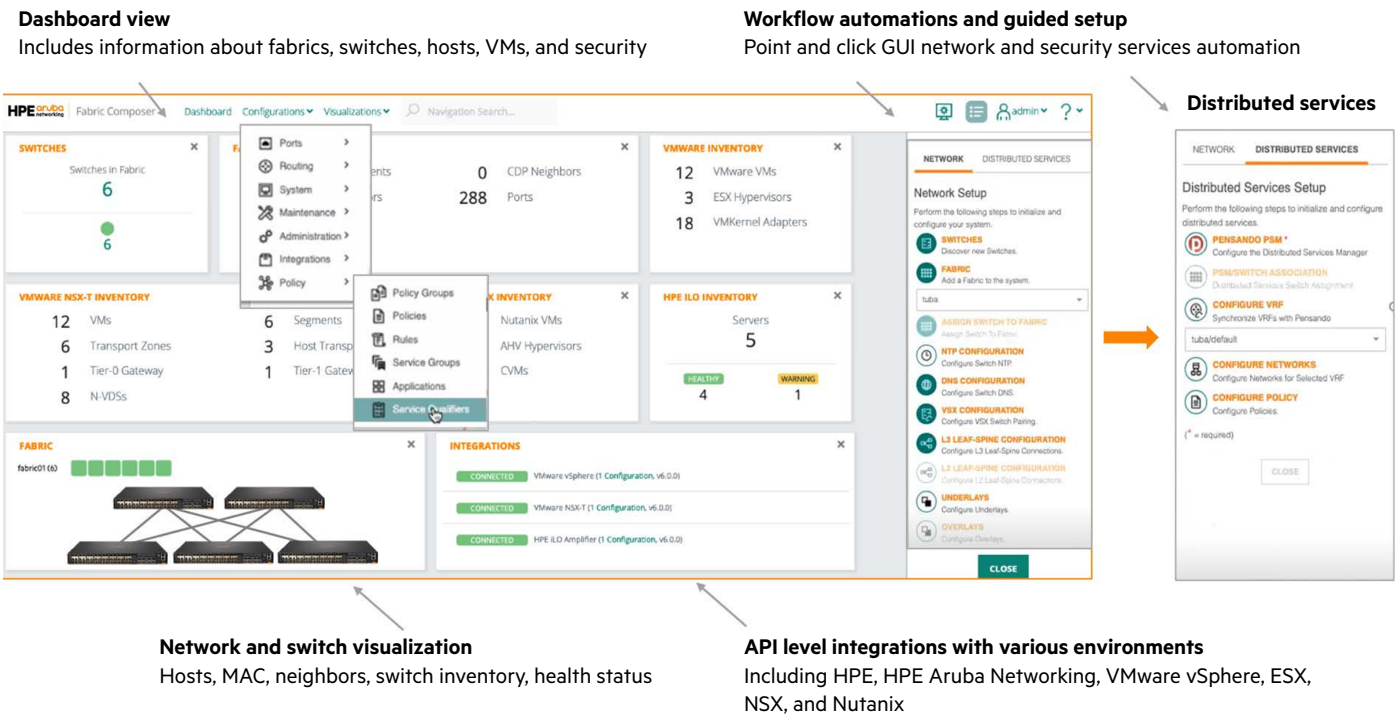


Figure 1. VMware vSphere integration—dashboard view

Network configuration—autoconfigured VMware fabric

HPE Aruba Networking Fabric Composer provides out-of-the-box automation to reduce configuration time and improve solution time to value. Wizard-based workflow automation helps eliminate the need for manual configuration. Customers will enjoy better network performance and VMware vSAN™ storage traffic.

Autoconfiguration

HPE Aruba Networking Fabric Composer automatically collects network, port, and grouping information from VMware, synchronizing the host and physical network infrastructures. Empowering VMware administrators through network automation avoids the need for manual infrastructure build-outs. As a result, the following components are then enabled with autoconfiguration capabilities:

- VLANs
- Optimized VMware vSAN network topology

Logical workload policies

One of the most basic functions of running a data center is creating new workloads. These workloads need physical resources in order to implement compute and storage. They also need network connectivity among servers, VMs, network interface cards, vSwitches, storage devices, and more.

Data center administrators leverage VMware Tools™ to deploy these workloads and define various VMs, storage logical unit numbers (LUNs), vSANs, VMware vVols, and other virtualized abstractions of the physical resources. They also need to define how these components are interconnected. The integration of HPE Aruba Networking Fabric Composer with VMware vCenter® easily synchronizes and automatically configures this interconnection without user intervention.

HPE Aruba Networking Fabric Composer provides the following capabilities in support of VMware data services:

- vMotion, which detects and visualizes vMotion events, documenting changes in the environment while providing event-based VLAN automation
- vSAN, which automatically discovers VMkernel adapters that participate in vSAN environments and creates an optimized network topology for vSAN storage workloads

Network configuration summary

HPE Aruba Networking Fabric Composer for VMware allows a customer to create a network for VMware ESX® environments. From a configuration perspective, the integration solves basic autoconfiguration issues. It also offers more advanced capabilities, such as improved policy automation for workload performance and automatic network services that apply to the VMware infrastructure. Thanks to vSphere, HPE Aruba Networking Fabric Composer has awareness of (and insight into) the VMware environment. It can adjust, accommodate, and optimize the network so virtualized apps get the best experience possible.

The result is an easy-to-use network with out-of-the-box automation that saves time and optimizes workload performance. Best of all, the fabric is already aware of critical VMware infrastructure services.

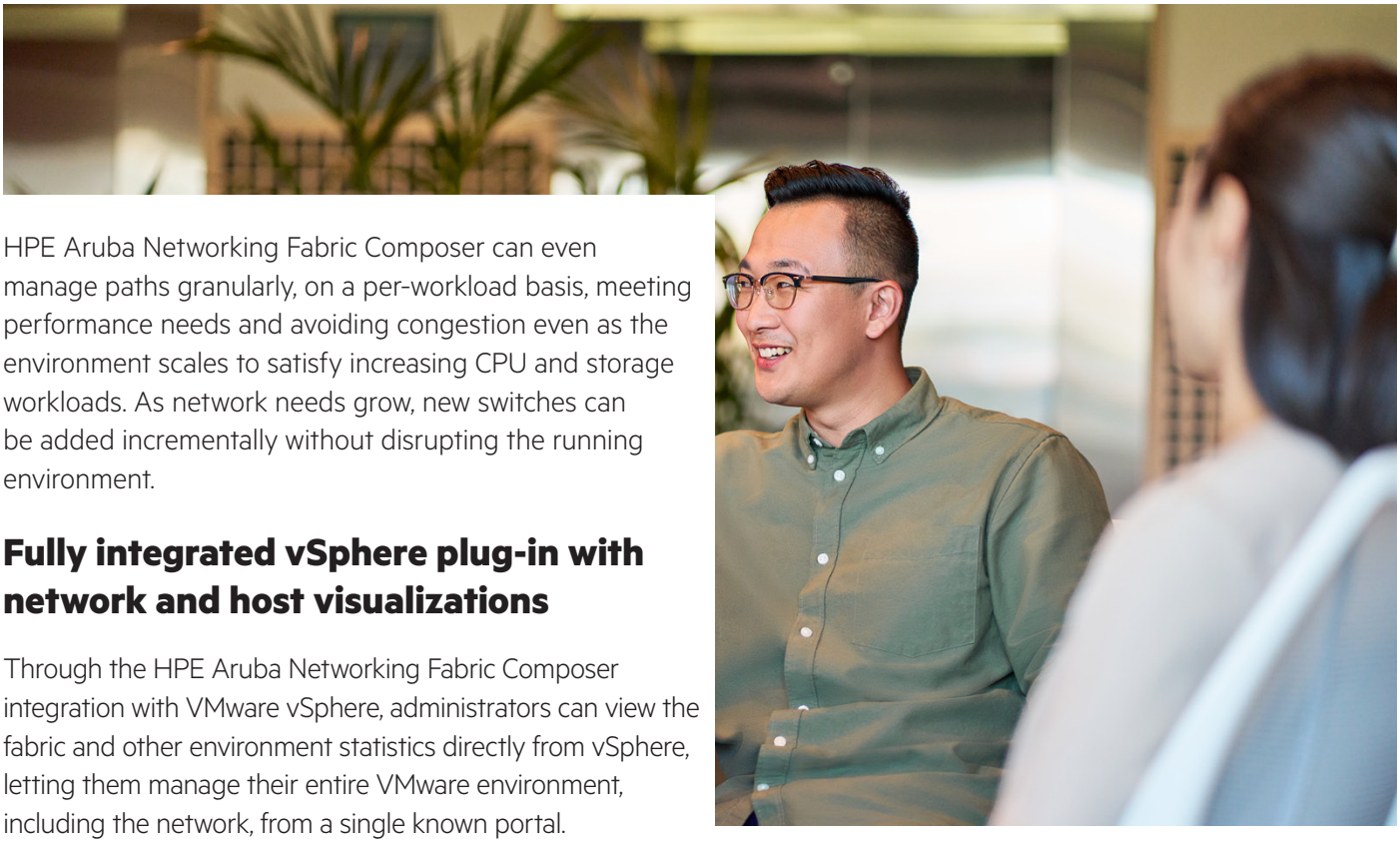
Management and operations

Network administration has traditionally been labor-intensive and time-consuming. In modern cloud-centric data centers that leverage virtualization, advanced software tools provide visibility and correlate the physical infrastructure to workload-related issues and problems. HPE Aruba Networking Fabric Composer with VMware vSphere allows customers to benefit from native VMware Tools by providing relevant details to the VMware dashboard. This integration simplifies the day-to-day operations of the data center and makes troubleshooting across the physical and virtual environments easier, allowing the VMware administrator to view everyday operational tasks from a single dashboard.

Per-workload path control

Traditional leaf-and-spine network approaches require manual, switch-by-switch CLI-based configuration to optimize performance workloads across the fabric. Because this traditional approach is often unaware of specific workloads, its random selection of network paths typically leads to network hotspots and congestion that is difficult to diagnose and remediate. This manual approach often leads to misconfiguration.

With HPE Aruba Networking Fabric Composer, administrators can automatically optimize network paths according to the needs of a given workload. Through its integration with higher-level orchestration and infrastructure management tools such as VMware vCenter, HPE Aruba Networking Fabric Composer is aware of application and infrastructure workloads and provides path optimization across the fabric. It then leverages this awareness to auto-discover vSAN VMkernel adapters and automatically optimizes its paths to satisfy the storage workload's needs for network performance.



HPE Aruba Networking Fabric Composer can even manage paths granularly, on a per-workload basis, meeting performance needs and avoiding congestion even as the environment scales to satisfy increasing CPU and storage workloads. As network needs grow, new switches can be added incrementally without disrupting the running environment.

Fully integrated vSphere plug-in with network and host visualizations

Through the HPE Aruba Networking Fabric Composer integration with VMware vSphere, administrators can view the fabric and other environment statistics directly from vSphere, letting them manage their entire VMware environment, including the network, from a single known portal.

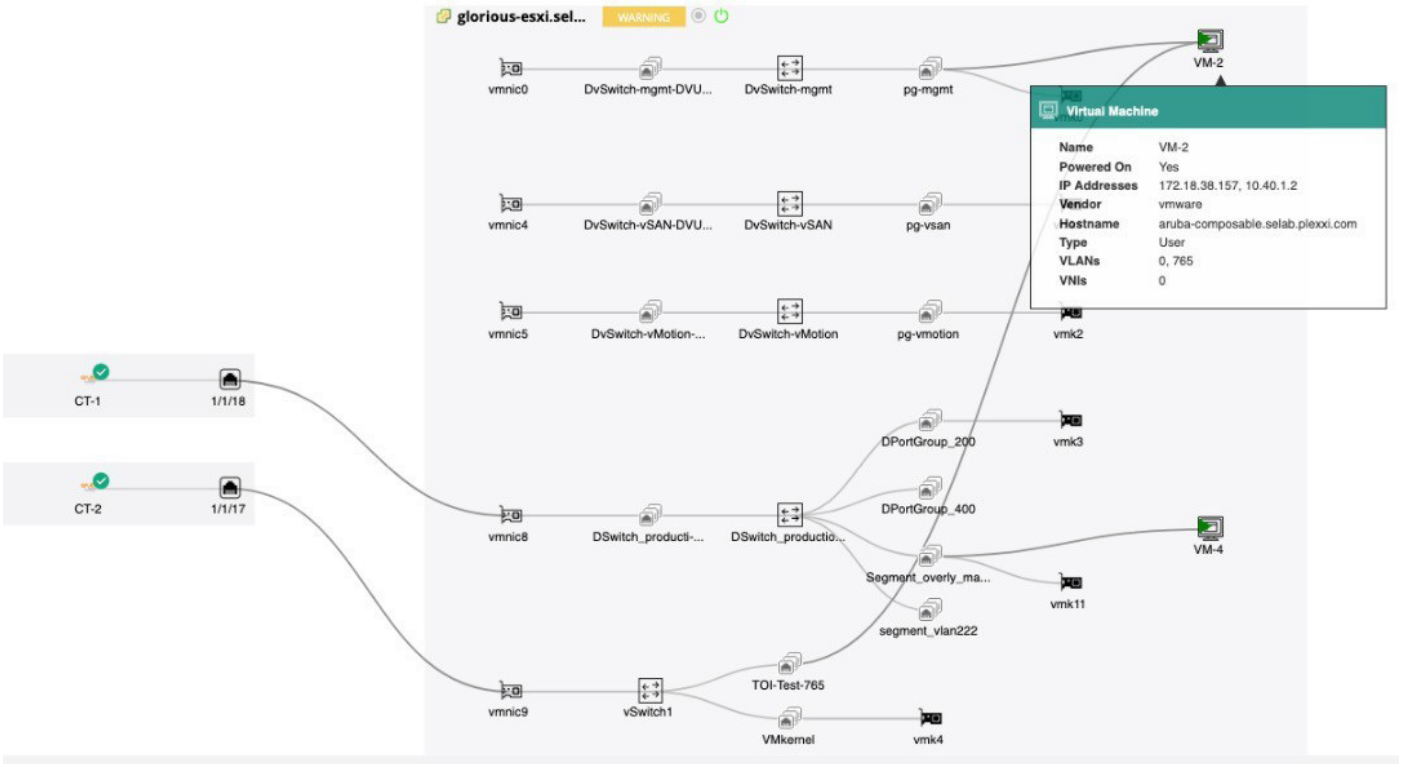


Figure 2. End-to-end visibility

Native network virtualization with VMware NSX and HPE Aruba Networking Fabric Composer

VMware NSX is a popular network virtualization solution. Network virtualization allows customers to define their networking constructs in software—such as virtual switches—that operates on the host devices themselves (within the hypervisor). The NSX software creates virtual networks that define specific connectivity among groupings of devices.

By contrast, when NSX runs on a traditional physical network, it runs as an overlay, which means there is little to no coordination between the virtual and physical network. The physical network is treated as a pure transport layer. This separation between physical and virtual network requires significant manual engineering and forethought to help ensure the physical network meets the needs of the virtual layer. When the physical network is reduced to transport only, it loses the visibility and awareness of the traffic, rendering it unable to react to congestion issues or other problems.

When NSX runs on an HPE Aruba Networking Fabric Composer infrastructure, this problem disappears. The physical network and the virtual network are natively and dynamically aligned, providing unified visibility, traffic awareness, VLAN automation, and traffic path optimization.

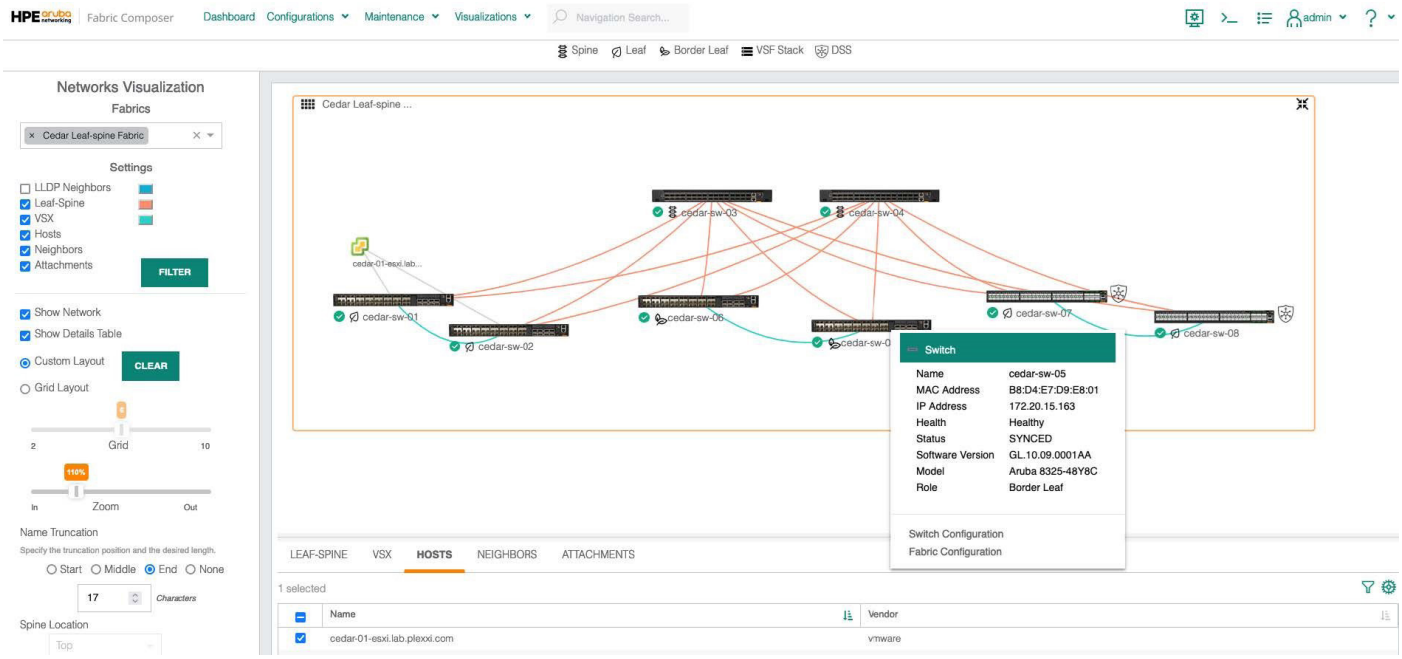


Figure 3. Full visibility across both virtual and physical networks

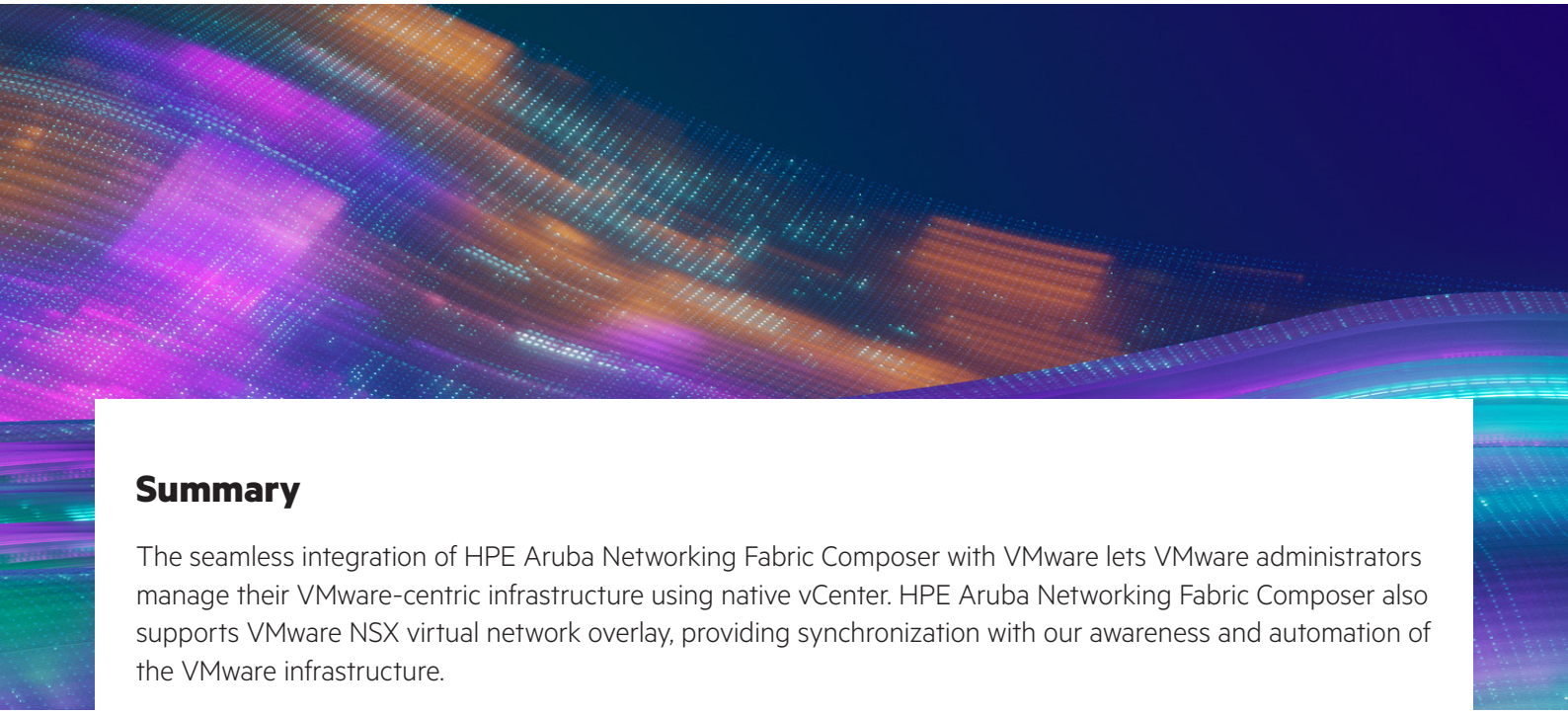
Tight virtual-to-physical integration

With HPE Aruba Networking Fabric Composer, tight virtual-to-physical integration is called overlay awareness. It includes the following key capabilities:

- Interfaces with the VMware NSX Manager to discover NSX components, including segments, transport zones, N-VDs switches, VNIs, Tunnel endpoints (VTEPs), VMware NSX® Edge™ services, VMkernel adapters, and VM IPs/MACs
- Visualizes the components in the HPE Aruba Networking Fabric Composer UI and makes them available for debugging, searching, and more
- Reacts to network changes made by NSX automatically and provides VLAN automation for segment and overlay VLANs
- Tracks the movement and expansion of ports, VLANs, and LAGs

These capabilities allow the physical and virtual networks to appear as a single network to the user. They also offer debugging and troubleshooting at each layer, with the relevant information correlated between layers. Unlike separate and disjointed over/underlay solutions, this type of native virtualization creates a more cohesive network infrastructure and drastically reduces provisioning times and mean time to repair.

Organizations building private clouds based on VMware's market-leading technology need a flexible and agile infrastructure. A fully integrated network such as HPE Aruba Networking Fabric Composer fits the bill. HPE Aruba Networking Fabric Composer without NSX integration delivers an easy-to-scale-out network fabric that organizations can fully operationalize from the VMware Cloud™ management tool. When adding NSX integration, the native network virtualization preserves the physical network's agility and creates a simplified engineering and architecture experience. The result is a fully optimized network that reduces errors and saves both time and money.



Summary

The seamless integration of HPE Aruba Networking Fabric Composer with VMware lets VMware administrators manage their VMware-centric infrastructure using native vCenter. HPE Aruba Networking Fabric Composer also supports VMware NSX virtual network overlay, providing synchronization with our awareness and automation of the VMware infrastructure.

HPE Aruba Networking Fabric Composer for VMware enables customers running VMware infrastructure to significantly reduce management complexity and operational costs and provides an easily scalable platform for nondisruptive, incremental network growth. With HPE Aruba Networking Fabric Composer, organizations become more flexible and agile, so they can react more quickly to changes in the business and IT infrastructure.

Plus, with the awareness of the VMware environment, many management tasks become automated, freeing up IT operational staff to focus on other IT needs.

HPE Aruba Networking Fabric Composer is simple, cost-effective, and synergistic with VMware infrastructure and tools.

Learn more at

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