

Infinera Vibe Programmable Carrier Class White Box Switch

Bringing Unmatched Flexibility and Scalability into Carrier Networking from Access to Core

The emergence of 5G networks along with a completely new set of use cases and services is forcing carriers to rethink their networks and infrastructure. For transport networks, the main challenges include multiplying capacity and addressing stringent latency needs posed by specific use cases such as augmented reality and autonomous driving. In particular, latency requirements push applications and services such as Multi-access Edge Computing (MEC) and security functions from the network core and large data centers closer to the access network, thus turning the aggregation sites into small data centers. Transport networks must be able to adjust and scale quickly to meet growing demands and easily deploy new functionalities through software. At the same time, carrier networks must ensure economic profitability while contending with the evolving technical requirements.

ENSURING A SMOOTH MIGRATION TO HYPERSCALE CARRIER ARCHITECTURE

Infinera Hyperscale Carrier Architecture (HCA) addresses these needs by disaggregating software and hardware functions and transforming data center principles into carrier architectures as suggested by Central Office Re-architected as a Data Center (CORD). HCA delivers an open, programmable network architecture for carrier operators to support innovative services over a highly efficient transport infrastructure. The Infinera advanced solutions portfolio supports a smooth migration toward HCA with a range of white box switches including the Infinera Vibe carrier-class white boxes, Infinera Network Operating System (NOS), Virtual Network Functions (VNF) solutions, and intelligent control based on the Infinera Transcend Solution SDN controller and orchestration including NFV in the Infinera Transcend MANO.

EVOLVING FROM VENDOR-SPECIFIC HARDWARE TO WHITE BOXES

Traditional carrier network routing elements, or black boxes, are closed vendor-specific systems where hardware and software are tightly integrated together. In contrast, white boxes are switch elements that are agnostic to the NOS enabling new carrier flexibility. The adoption of white boxes has begun with IT and data centers and is gradually achieving traction among telco carriers as well. Key drivers for white boxes are flexibility, lower CapEx, and reduced operating costs through network automation. White boxes contain basic mechanics, the merchant processor, and switching fabric that together enable customization with the NOS and other software for specific use cases.

BENEFITS OF THE INFINERA VIBE WHITE BOX SERIES

- **Provides** a white box switch designed for carrier use and multiple locations
- **Eliminates** vendor lock-in by opening the hardware for multiple types of Network Operating Systems
- **Offers** full resilience and incremental scaling with unique multi-unit concept
- **Fits** ideally into 5G networking with versatile synchronization capabilities
- **Adapts** to distributed network designs with openness to software function hosting

ELEVATING TRADITIONAL WHITE BOX CAPABILITIES

The white boxes today are predominantly focused on IT and data center use cases. However, there is a gap in white box offerings that can meet specific carrier requirements in terms of installation environments, form factors, and use cases, which currently prevents extensive white box adoption. To effectively address these carrier requirements, Infinera has designed and developed the Vibe Series. The Vibe switches are loaded with Open Network Install Environment (ONIE), which enables the installation of a compatible Network Operating System (NOS). In addition, the Vibe Series provides accurate synchronization mandated by mobile networks, compact form factors, ideal mechanics for telco site installations, and temperature hardening to sustain varying deployment locations. The Vibe Series contains a merchant switching silicon, standard Intel processor, and Linux operating system.

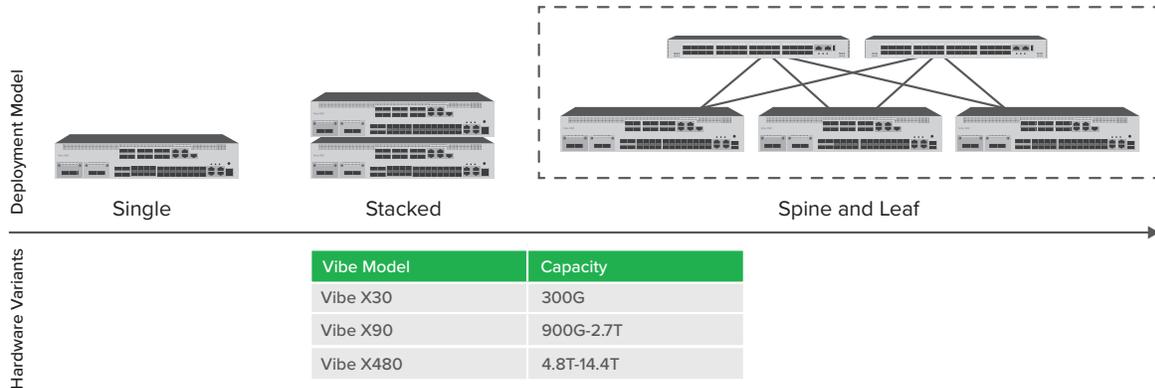


Figure 1: Infinera Vibe Series Overview

As shown in Figure 1, the Vibe Series encompasses various platform variants ranging from 300 Gbps to 14.4 Tbps. With its highly scalable architecture, the Vibe Series can be positioned in the network from access to core. It provides the basis for building flexible and versatile networks for any carrier use case from 4G/5G anyhaul and IoT to residential and enterprise services. Additionally, Vibe switches provide a unique multi-unit concept for incremental scaling and full redundancy, fundamental capabilities for business continuity, perceived service quality, and simplified operations. Spine and leaf architectures enable horizontal scaling to achieve greater capacity and introduce new services.

SELECTING SOFTWARE WITH VALUE-ADDED OPTIONS

The Vibe Series provides maximum value when used together with the Infinera NOS, which leverages the integrated carrier-class capabilities of Vibe. Additional network and service functions can be hosted as VNFs on the Vibe if needed, as shown in Figure 2.

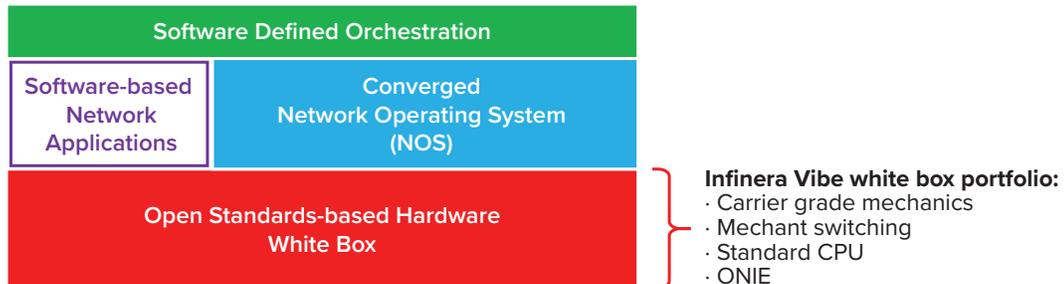


Figure 2: Flexible Software Options of the Infinera Vibe White Box

Disaggregation naturally increases the number of network elements that require advanced management and control in order to ensure automation and network simplification. To support open networking, Vibe switches provide open APIs and communication through industry standard interfaces such as NETCONF. The Infinera Transcend Solution, including controller and orchestration, hides the network complexity by abstracting and automating operations across multi-vendor, multi-domain, and multi-technology networks.