PICA8
WHITE BOX SDN

Network Virtualization and VXLAN Overlays with White Box Switches

Why Pica8?

- **Best price-performance:** Use commodity white box hardware to build a physical network foundation for network overlays
- **Fully standards-based:** Seamlessly support multiple overlay approaches and SDN controllers for greater flexibility and choice
- **Lower operational costs:** Simplify programmability and integration of different network virtualization and overlays with a common API
- **Investment protection:** Future proof your network with support for open networking and protocols

Virtual Machines and Mobility

Virtualization is driving transformative change in the data center. Servers and workloads are becoming more virtualized, leading to a more agile application infrastructure.

The reason is clear – previously it took weeks to months to acquire and provision servers for new applications. With server virtualization, operators can create a virtual machine in seconds.

What about the network? Physical networks are difficult to configure on the fly. A virtual network is something that be configured and controlled via software, and is ideal to dynamically manage traffic and tenants across the same set of physical resources. These virtual networks (overlays) are an important component of Software-Defined Networks (SDN), and can have different characteristics and policies based on user requirements.

The Rise of VXLAN and VTEPs

There are a variety of approaches to overlay networks. One in particular, VXLAN (Virtual eXtensible LAN) is a standards-based Layer-2 overlay technology (RFC 7348). It solves the issues of VLAN logical scale and extending Layer-2 connectivity across Layer-3 domains. VXLAN is gaining in popularity for cloud environments, and is ideal for multi-tenant cloud networking, interconnecting multiple data centers, VM mobility, and disaster recovery (DR) scenarios.

VXLAN overlays can be controlled by an SDN controller. There are different options in the market, but typical examples include Midokura MidoNet, VMware NSX, and OpenContrail.

VXLAN requires the use of VTEPs (VXLAN Tunnel EndPoints) to perform encapsulation and de-encapsulation operations on network traffic. A VTEP can be a physical network device or even a virtual machine, and is critical to map virtual workloads to physical devices.

A network switch needs to be able to act as a VTEP to function properly in these environments.

PicOS: Standards-based Overlays on White Box Switches

Pica8's PicOS™ network operating system (OS) is a Linux-based OS that runs on standard, commodity white box switches. PicOS runs standards-based Layer-2 and Layer-3 protocols with support for key features critical for data center networks such as a network Command Line Interface (CLI), automation scripts and APIs, and Zero Touch Provisioning (ZTP). PicOS is qualified to run on proven, high performance hardware, and can be purchased either as a software license, or pre-loaded on a qualified switch platform. PicOS provides an ideal converged automation framework by combining scripting with Linux, orchestration and workflow tools.

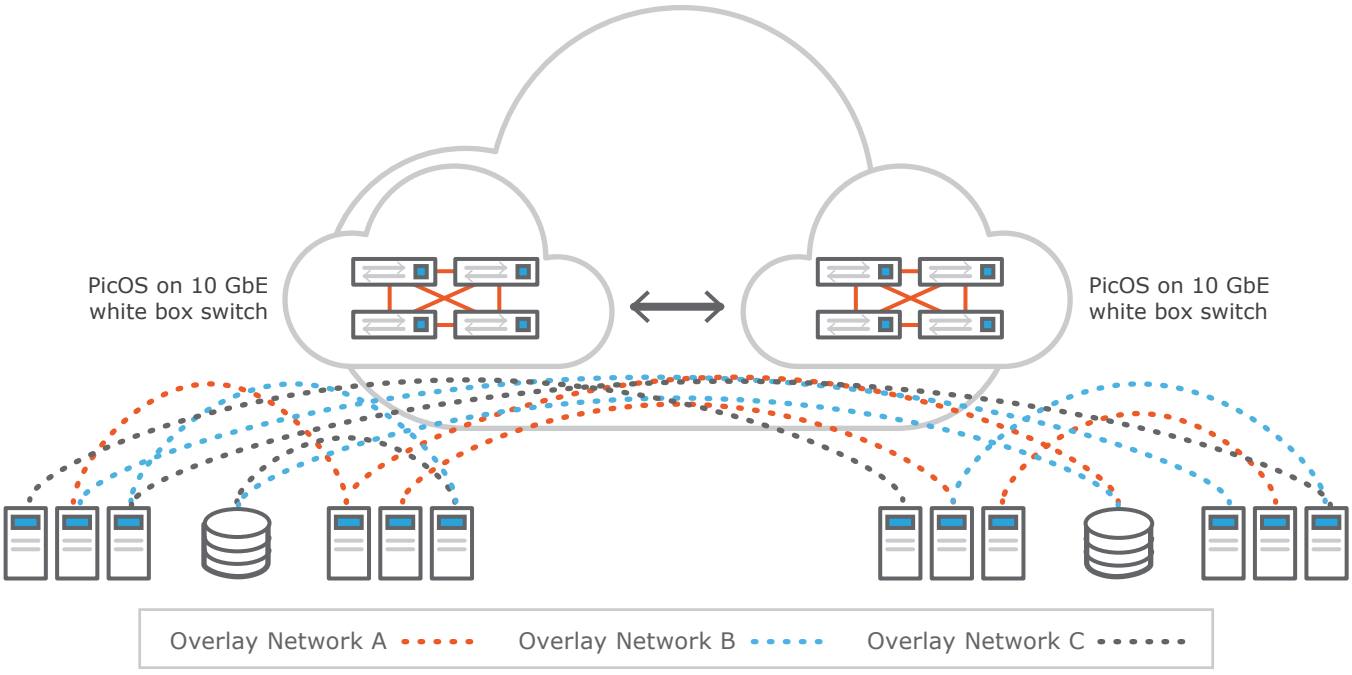
A Pica8 switch running PicOS features a hardware-accelerated implementation of OVS and can act as a VTEP. PicOS also supports a variety of SDN controllers via a standard API based on OVSDB.

VXLAN on PicOS

PicOS running on a white box switch is an ideal platform to build a physical network infrastructure for VXLAN overlays because it:

- Supports different SDN controllers to give customers choice and flexibility
- Uses a standard protocol (OVSDB) to allow operators a common way to program the overlays
- Leverages disaggregated software and hardware to provide operational freedom and white box economics
- Leverages hardware-accelerated OVS for improved network performance

Sample VXLAN Overlay Using Pica8 White Box Switches



Standards-based Overlays

- Standards-based VXLAN Support (RFC 7348)
- OVSDB protocol as a common API
- Common interface for ease of programmability

SDN Controller and Software Orchestration Support

- Midokura MidoNet
- VMware NSX
- OpenContrail
- Software orchestration via OpenStack

White Box Hardware Foundation

- Hardware-accelerated OVS implementation
- Wire speed VTEP capabilities
- Hardware, ASIC, and interface choice

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