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AUTOMATION & TRANSFORMATIONS

The status of White Box Networking

What if networks could shapeshift to help your business adapt at pace?

Explore how Linux Based Network portfilio broad portfolio of Ethernet and InfiniBand technologies can enhance your network and take your

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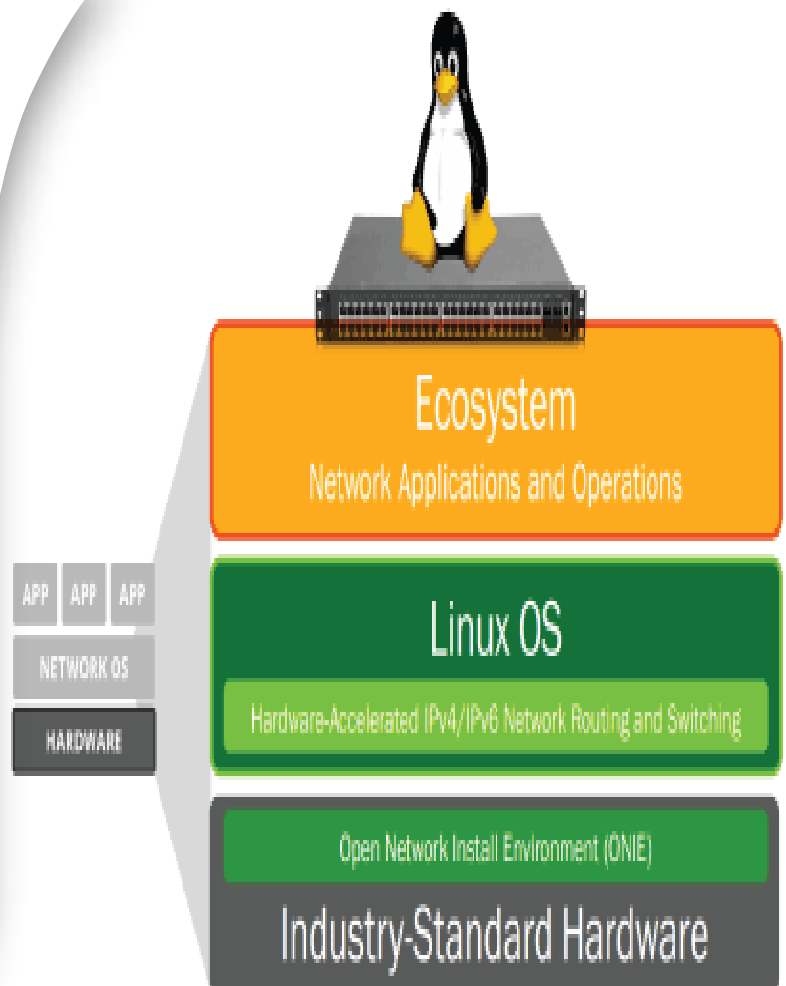# THE FACE OF CARRIER NETWORKS with WhiteBox Networks

White box switches and routers with independent network operating systems can offer significant benefits in terms of cost and operational flexibility. Leading hyperscale cloud providers have widely deployed white box switches in their large data centers.White box networking provides the ability to deploy generic, commodity off-the-shelf switches or routers with an independent network operating system (NOS) that drives Layer 2 and Layer 3 intelligence.

We deliver the promise of network disaggregation is liberation from proprietary hardware by emphasizing white-box gateways. Pre-validated and optimized through partnerships with SD-WAN VNF vendors, we provide a white-box appliance portfolio designed to accelerate time-to-market deployment for service providers.

• White Box Switching in SDN Environments

Within an SDN environment, the apps running on top of the SDN Controller are what provide the higher level orchestration and programmability of the network.
The SDN Controller uses OpenFlow (or another southbound API) to program the forwarding table of the white boxes and dictates how to route connections to accomplish the appropriate tasks for the applications.
Because they are so flexible, white box switches an also be used to support a range of open source manage ment tools, including OpenStack, Puppet, and Chef which is a feature of most SDN switches.

APP APP APP

NETWORK OS

HARDWARE

Ecosystem
Network Applications and Operations

Linux OS
Hardware-Accelerated IPv4/IPv6 Network Routing and Switching

Open Network Install Environment (ONIE)

Industry-Standard Hardware

Exploring Disaggregation of Network

Delivering the goal of disaggregation of vertically integrated Networks in general is to decompose the essential hardware and software components into logical building blocks for recombining as need to provide a more ideal balance of cost and capability for a particular deployment scenario.

Explore the benifits of Linux architecture, which allows you to automate, customize, and scale your data center like no other NOS.

1 Redistribute Neighbor (RDNBR): Get virtual machine (VM) and host mobility by plugging your server into any RDNBR switch and making it Layer 3-discoverable on the fabric.

2 RDMA over Converged Ethernet (ROCE): Realize blazing fast speeds and the lowest latencies with ROCE implementation that's ready with just one line of code.

3 Ethernet Virtual Private Networks (EVPN): Get the most advanced capabilities available for EVPN and allow legacy Layer 2 applications to operate over next-generation Layer 3 networks.

4 Scale Enhancements: Take advantage of multiple VNIS that can be mapped to a single Linux"device," with bridges that support thousands of tunnels

5 Virtual Routing and Forwarding: Run multiple network paths without the need for multiple switches, giving you traffic isolation and network segmentation for multiple devices.

6 Unnumbered Interfaces: Benefit from a simplified Internet Protocol (IP) approach for Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF) with just one IP template for leaf nodes and one for spine nodes.
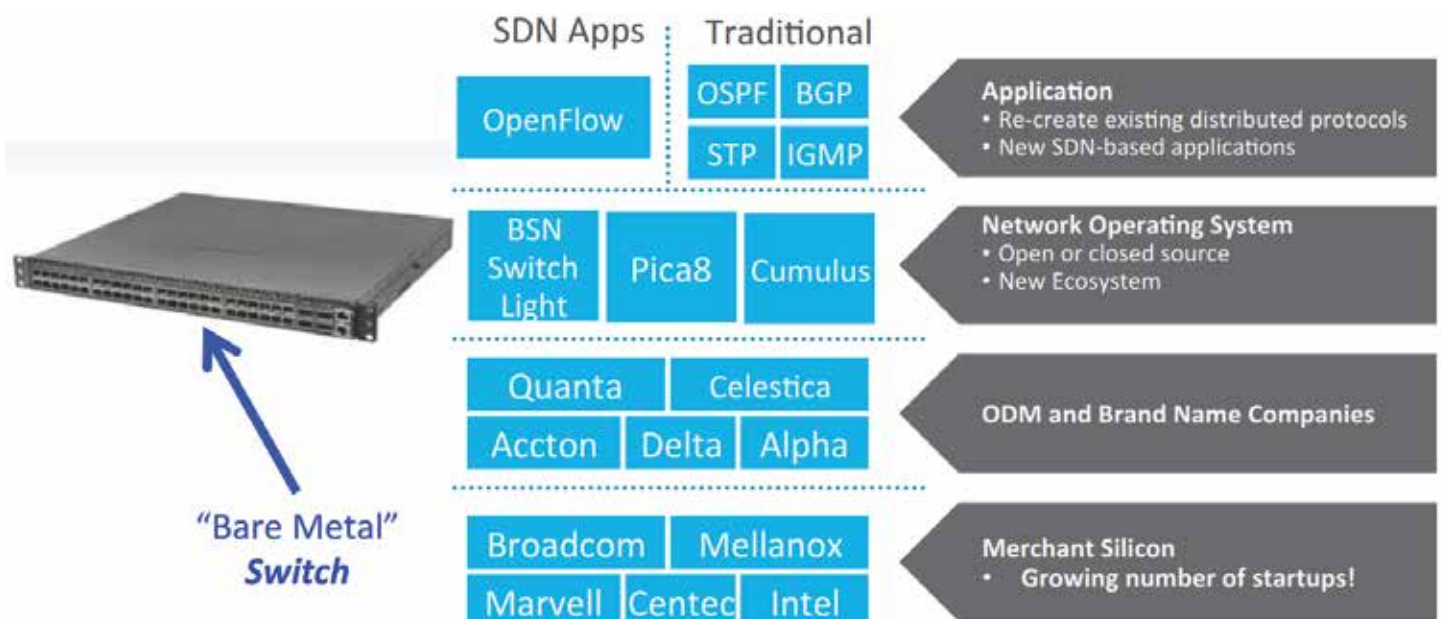
Time for WhiteBox Switches in the Enterprise

White box (and branded brite box) switches and networks offer a viable alternative, with open platforms that simplify network operations and improve performance - while dramatically lowering costs.

White box switch hardware
Exactly the same as the brand names, from the same manufacturers — without the hefty price

Open network operating systems
Linux-based, portable, feature-rich

White box switches and networking in practice
Handle the edge traffic onslaught, improve performance, add SDN for security and control

PICA8 AmpCon

Simplified operations & automation
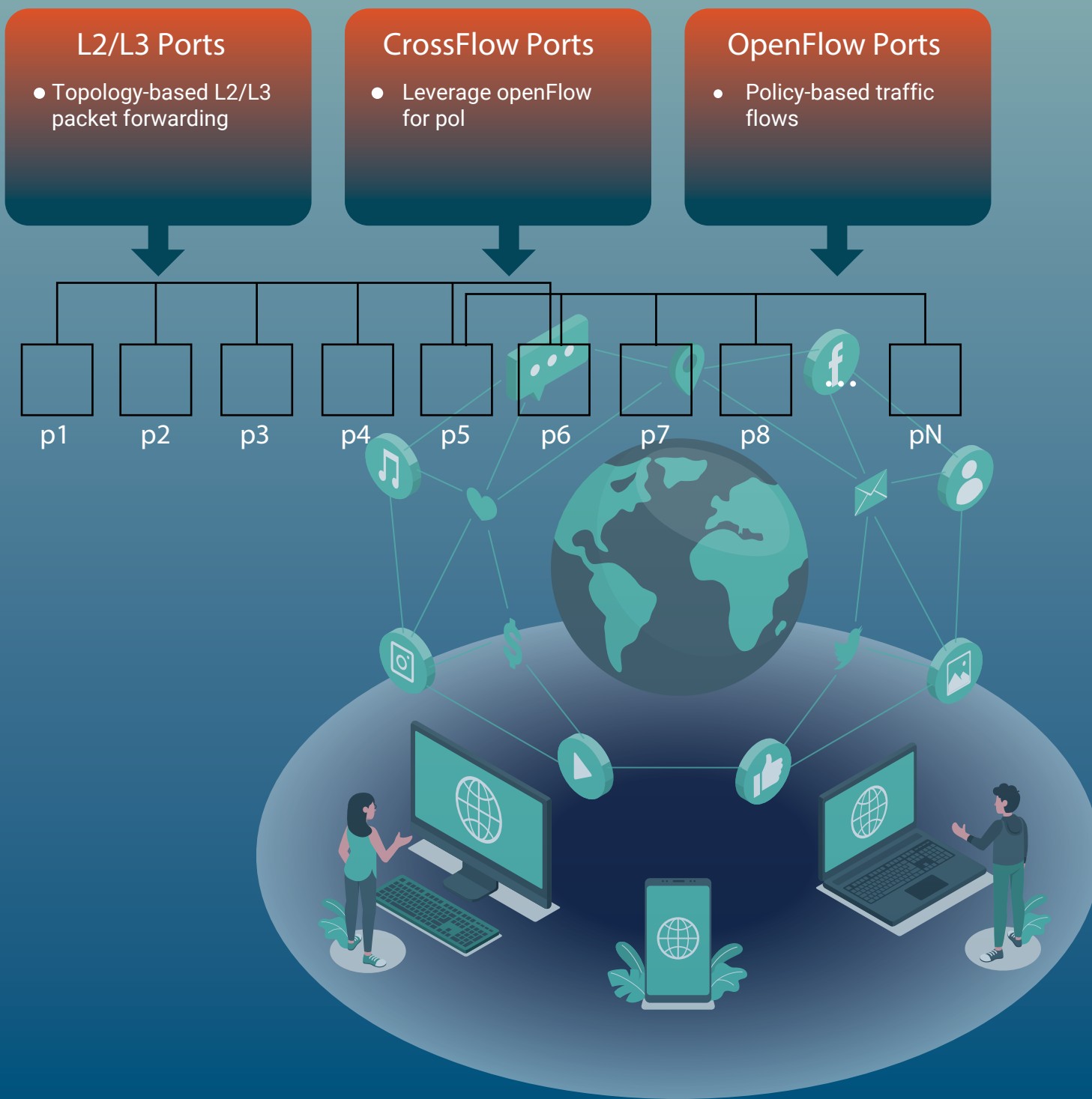AmpCon™: the first automation software suite for enterprise white box switches and networks

Essentially, white box switch hardware is the same standard hardware used by traditional networking vendors such as Cisco and Juniper, with one big difference: the network operating system that runs on top (well, that and the price).

SDN Apps : Traditional

OpenFlow | OSPF | BGP | STP | IGMP

Application
• Re-create existing distributed protocols
• New SDN-based applications

BSN Switch Light | Pica8 | Cumulus

Network Operating System
• Open or closed source
• New Ecosystem

Quanta | Celestica | Accton | Delta | Alpha

ODM and Brand Name Companies

Broadcom | Mellanox | Marvell | Centec | Intel

Merchant Silicon
• Growing number of startups!

"Bare Metal" **Switch**

Benefits of white box networking in practice

The open white box approach can also facilitate the deployment of a more streamlined leaf-spine network topology rather than the traditional three-tier model, with its static access, aggregation and core layers. With the leaf-spine model, enterprises can collapse the access and aggregation layers into one. In many cases, the network can then be configured such that there's only a single "hop" between any two devices, providing more streamlined connections and improved performance as compared to the three-tier model.

L2/L3 Ports
- Topology-based L2/L3 packet forwarding

CrossFlow Ports
- Leverage openFlow for pol

OpenFlow Ports
- Policy-based traffic flows

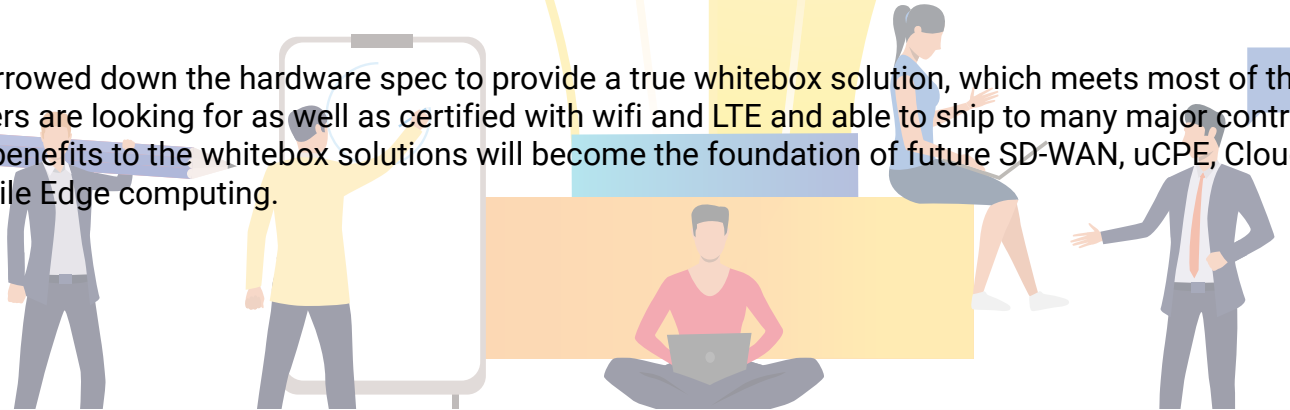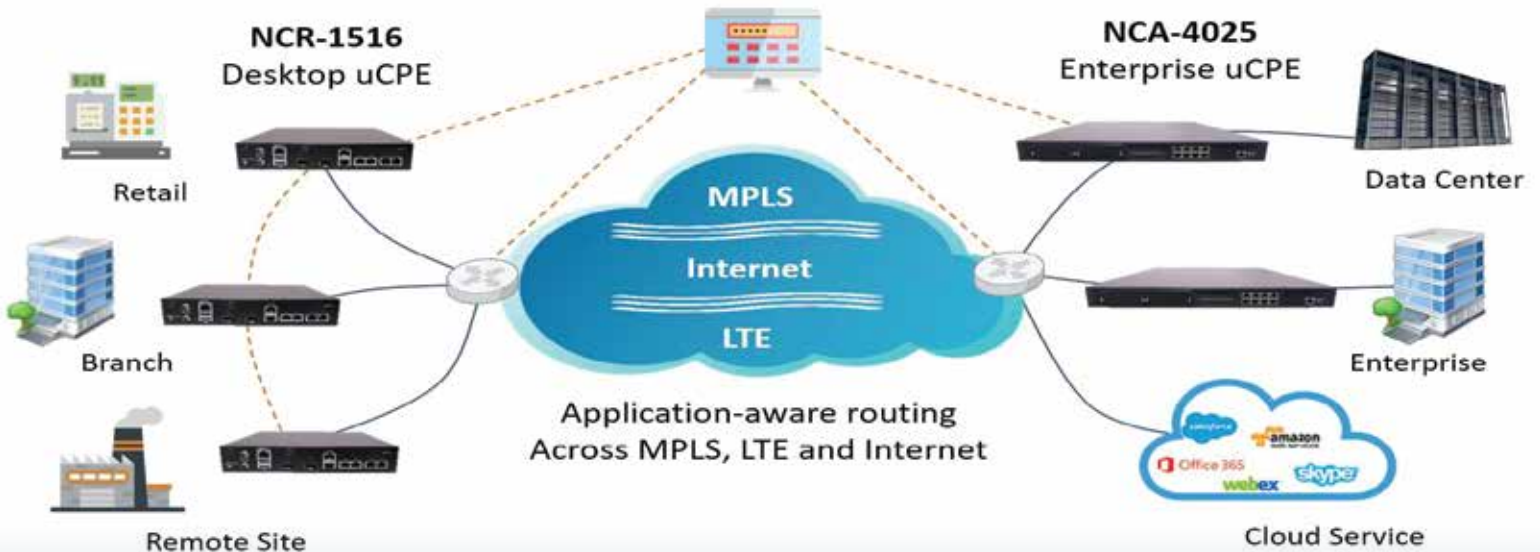p1   p2   p3   p4   p5   p6   p7   p8   pN

NFV-ready Whitebox uCPE Solutions

Organizations with distributed branch offices are having difficulty installing and maintaining WAN implementations. Current WAN technologies are complicated, expensive, and rigid. For example, whe provisioning a network service to a branch office, organizations require a new CE (Customer Edge) to be sent to the branch office, plus new lines, configuration, and synchronization with PES (Provider Edge), and of course, the presence of a technician. The expens es end up being relatively high.

ATNIS has narrowed down the hardware spec to provide a true whitebox solution, which meets most of the spec customers are looking for as well as certified with wifi and LTE and able to ship to many major contries globally. The benefits to the whitebox solutions will become the foundation of future SD-WAN, uCPE, Cloud RAN and Mobile Edge computing.

Whitebox uCPE for Distributed Enterprise

Network & Application Visibility Portal

Monitor Firewall Encryption Routing Apps

NCR-1516 Desktop uCPE

NCA-4025 Enterprise uCPE

Retail

Branch

Remote Site

MPLS

Internet

LTE

Application-aware routing Across MPLS, LTE and Internet
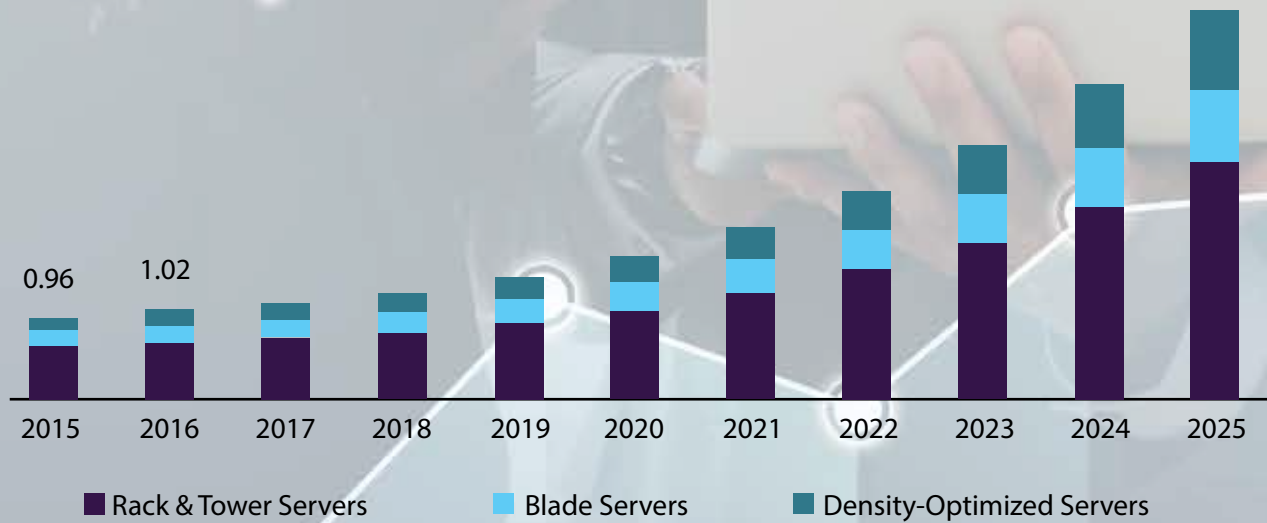
Data Center

Enterprise

Cloud Service

A Glimpse Into the Business of White Box Switches

The global white box server market size was valued at USD 5.61 billion in 2017. It is projected to register a CAGR of 22.0% during the forecast period. A white box server is a customized server built either by assembling commercial off-the-shelf components or unbranded or generic computer products supplied by original design manufacturers (ODM).

U.S. white bos server market size , by server type, 2015 - 2025 (USD Billion)

0.96 1.02

2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

■ Rack & Tower Servers   ■ Blade Servers   ■ Density-Optimized Servers

Commercial Software (Operating System) Vendors

cumulus

ip infusion
OcNOS VIrNOS

big switch
networks

PICA8

Optimized for the open networking era

Get more agility, more choices and lower costs than proprietary networks with open, standards-based switches.Deploy modern workloads and applications while providing an easy on-ramp to software-defined networking (SDN).

- Real-time analytics and controls manage your private and public connections, SD-WAN devices, clouds, applications, voice and video communications, and more.
- Disaggregated-hardware/software solutions bring new levels of freedom and flexibility to your data center. Support for Open Network Install Environment (ONIE) enables zero-touch installation of alternate network operating systems.
- Your choice of network operating system helps simplify data-center fabric orchestration and automation.
- A broad ecosystem of applications and tools, open-source and Linux-based, provides more options to optimize and manage your network.
- Proven global services and support from ATNIS help you innovate with confidence.

Why ATNIS?

We supply virtualization-optimized whitebox network platforms pre-validated with these software providers, making these appliances optimized for VNF deployments and accelerating the service time-to-market. We provide true whitebox solutions which meet most of the specifictions that customers are looking for, as well as certified with WiFi and LTE that can be shipped to many major countries globally.

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