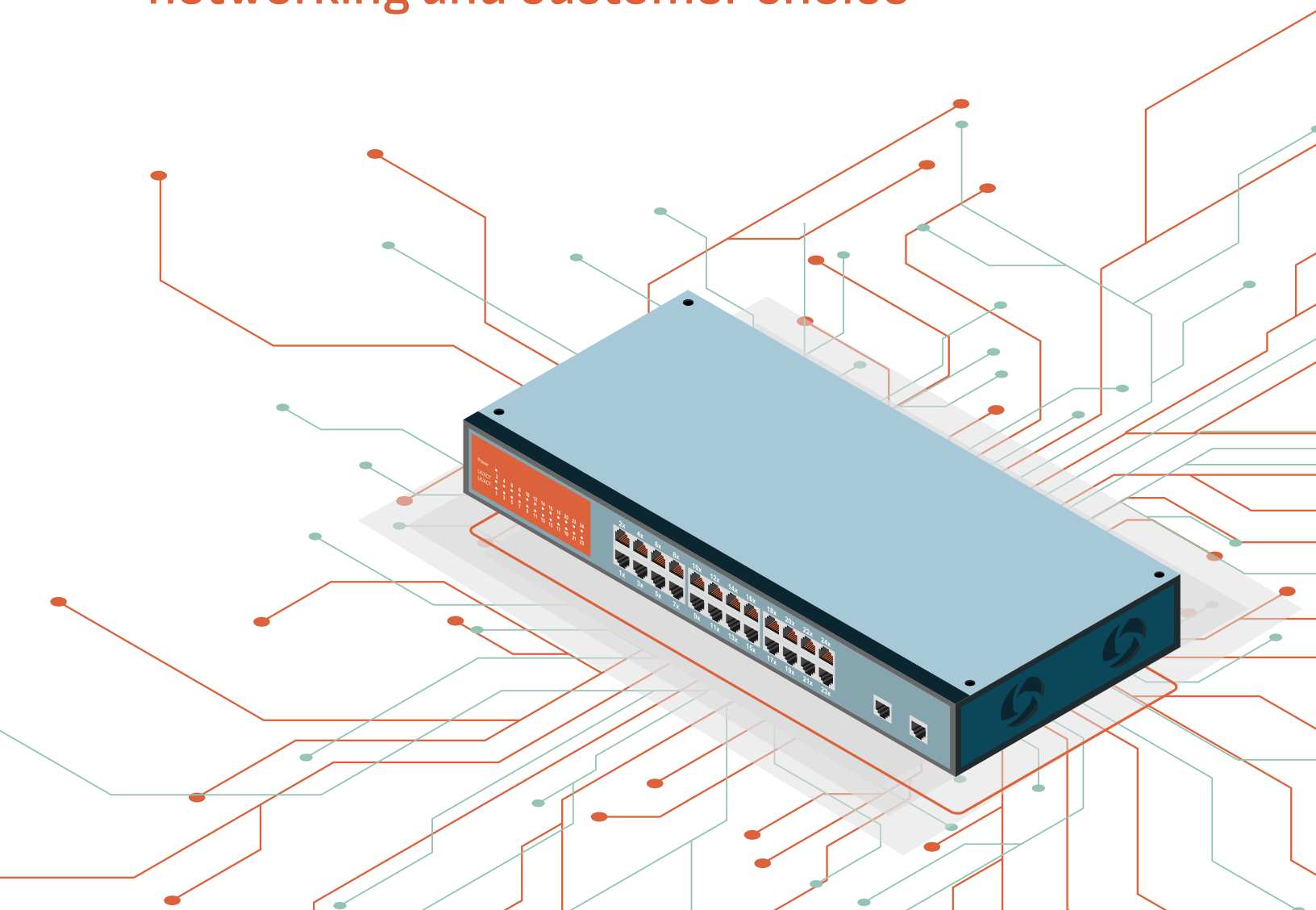
PICA8

Making a Business Case for White Box Networking

Exploring the benefits of open networking and customer choice



Introduction

According to Gartner[1] 90 percent of enterprise data centers are running solely on traditionally integrated switches, locking the enterprise into one vendor's maintenance and upgrade cycles. Technology leaders are increasingly fighting against these limitations by choosing their own networking operating system (NOS) to disaggregate their networks and separate the hardware from the day-to-day operations.

The most common approach is white box networking, where networks operate on open switches. Historically only accessible to hyperscalers with deep pockets, white box (or open) networking is now more accessible than ever thanks to recent innovation in networking operation software.

With open networking, establishing a seamless NetDevOps (Network Developer Operations) function will be vital to support companies building out distributed networks — across the core, cloud, and edge. Choosing the right network operating stack to meet their purpose will be pivotal to their success.

Much like DevOps before it, NetDevOps is on track to be a primary business driver as organizations recognize the impact of network operations on its CapEx and OpEx. Leading organizations will prioritize networking software that lowers costs and simplifies deployment and management — giving them the same edge enjoyed only by the hyperscalers previously.

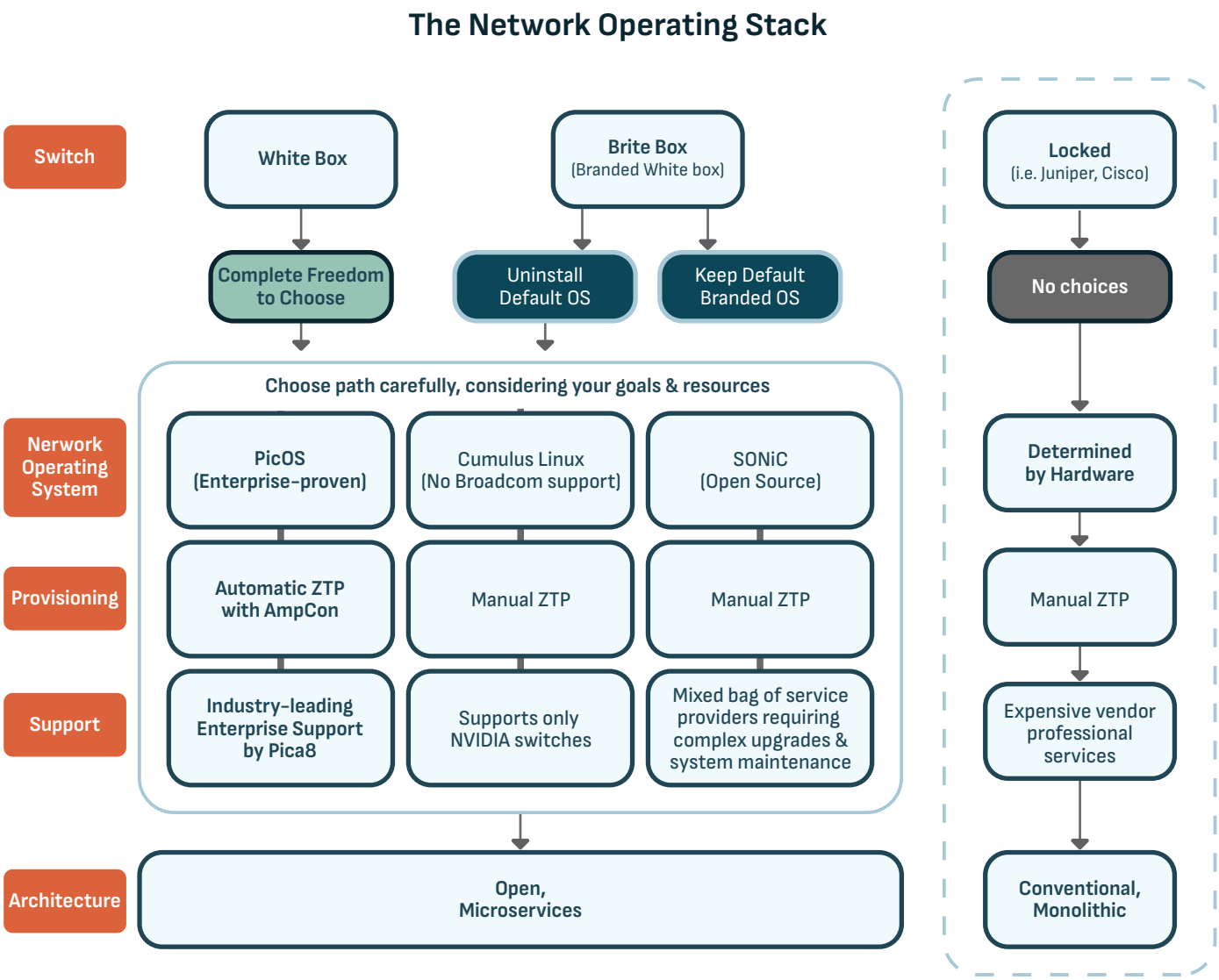
Runaway cloud costs and security incidents are sending businesses back to the data center, but they lack the operational excellence to deliver cost-effective, resilient network connections. Fortunately, open networking is a proven solution that is now more accessible than ever.

1 Gartner Market Guide: Data Center Switching, Jan. 21, 2023

The Network Operating Stack

When looking to build (or rebuild) your network operating stack, software should be your primary consideration beginning with your vendor review. While evaluating hardware options, you can find identical technical specifications at almost any vendor. However, the software running the hardware is not all created equal and focusing on hardware will seriously limit your options.

In today's market, there are typically three options for an organization to consider when building their network operating stack: (1) white box, (2) brite box, and (3) locked or vertically-integrated box.



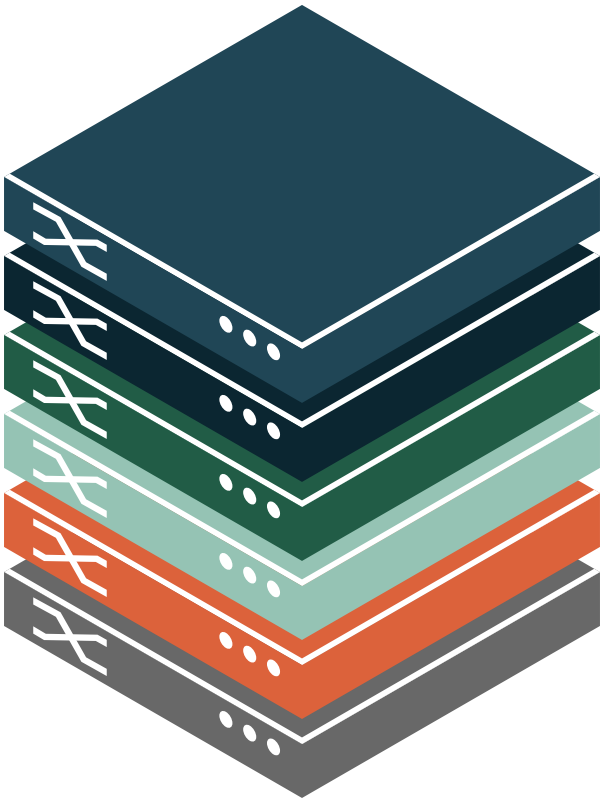
The most limited option is the last one: where the organization locks in to one vendor (i.e. Juniper, Cisco) to provide all hardware, software, and ongoing support. This means they are at that vendor's whim in terms of timelines for upgrades, updates, and hardware availability.

For organizations wanting to avoid lock in, they should consider white box or brite box networking. At the hardware level, a white box switch is no different from the big-box switches. It consists of standard 1U, 48-port Ethernet switches, and supports speeds from 1G to 400G. The difference lies at the software level where a white box switch can utilize any network operating system, while locked switches can use only the vendor's proprietary NOS.

Brite box, or branded white box switches, are a middle-of-the-road option. The vendor provides a switch preloaded with their proprietary software, which can later be uninstalled to install the NOS of your choice.

Switches running a modern, Linux-based NOS are disrupting the enterprise campus network market providing a commercially-proven alternative to organizations who have spent decades bending to the will of their entrenched switch and router equipment vendors.

Similar to the server market, where virtual server software radically changed development by abstracting the hardware layer, the NOS abstracts, or disaggregates, the network from the switches it is running on. This creates the potential for an "open," agile NOS that can run on a wide variety of switches from multiple vendors depending on need, costs, and/or hardware availability. No longer is an organization permanently locked in to a single vendor's hardware and software development cycle.



What role does open source play?

Open source drives a lot of technology innovation, but it's not for everyone. Open source projects often have shifting priorities that may or may not align with your organization's needs. These projects also heavily rely on an active group of contributors and volunteers to implement new capabilities and keep security measures. up to date. Organizations that then utilize this open source software for mission-critical infrastructure may find this software development process too opaque or slow, eventually requiring that they turn to third-party providers for support and/or custom development which incurs additional costs and delays.

Many don't realize that implementing open networking doesn't require piecing together your own support and maintenance team with specialization in that particular open source project, such as SONiC. Unfortunately, those intimidated or failed by SONiC often see big-box vendors, like Juniper or Cisco, as their only option.

No organization should have to trade freedom of choice for reliable support. At Pica8, we believe open networking, with its flexibility, performance, and lower total cost of ownership (TCO), should be accessible to any organization — not just the hyperscalers. Open networking is an alternative that leverages all the benefits of the familiar operating and protocol stacks of open source Linux, wrapped in a stable platform and already proven in the enterprise with industry-leading support.

The benefits of an open networking stack

Proprietary platforms have limited agility, slower access to new technologies, unreliable hardware availability, and costly upgrades and support. Open networking eliminates single-supplier dependency on critical networking infrastructure while delivering a more resilient, programmable, and scalable networking operating system at a lower TCO.

1. Eliminate vendor lock in

The idea behind using an open networking stack is that it can be ported to any vendor's hardware platform. That means there's no more vendor lock-in for hardware or software. As advances come along in either, organizations are free to take advantage of these without the complexity involved in migrating from one proprietary switch vendor to another.

2. Lower total cost of ownership (TCO)

Pairing commodity hardware with open-standards-based disaggregated NOS software makes white box switches far less expensive than traditional legacy appliances in terms of capital costs. For example, the hardware/software list price for a fully configured white box version of a Cisco 6500-class chassis switch is about 20 percent of the cost of the legacy Cisco switch. Beyond significant cost savings, the white box "replacement" also provides significantly higher density and performance. Automation can also be used to simplify configuration and lifecycle management making ongoing operations far easier and efficient.

3. Increase flexibility & performance

By using an open networking stack, enterprises can select the best combination of switches most suited for each deployment in terms of redundancy, density, speeds, features, power profile, port counts, and availability. Without sacrificing consistent and unified activation, programming, network management, monitoring, special features, and behavior across their network infrastructure.

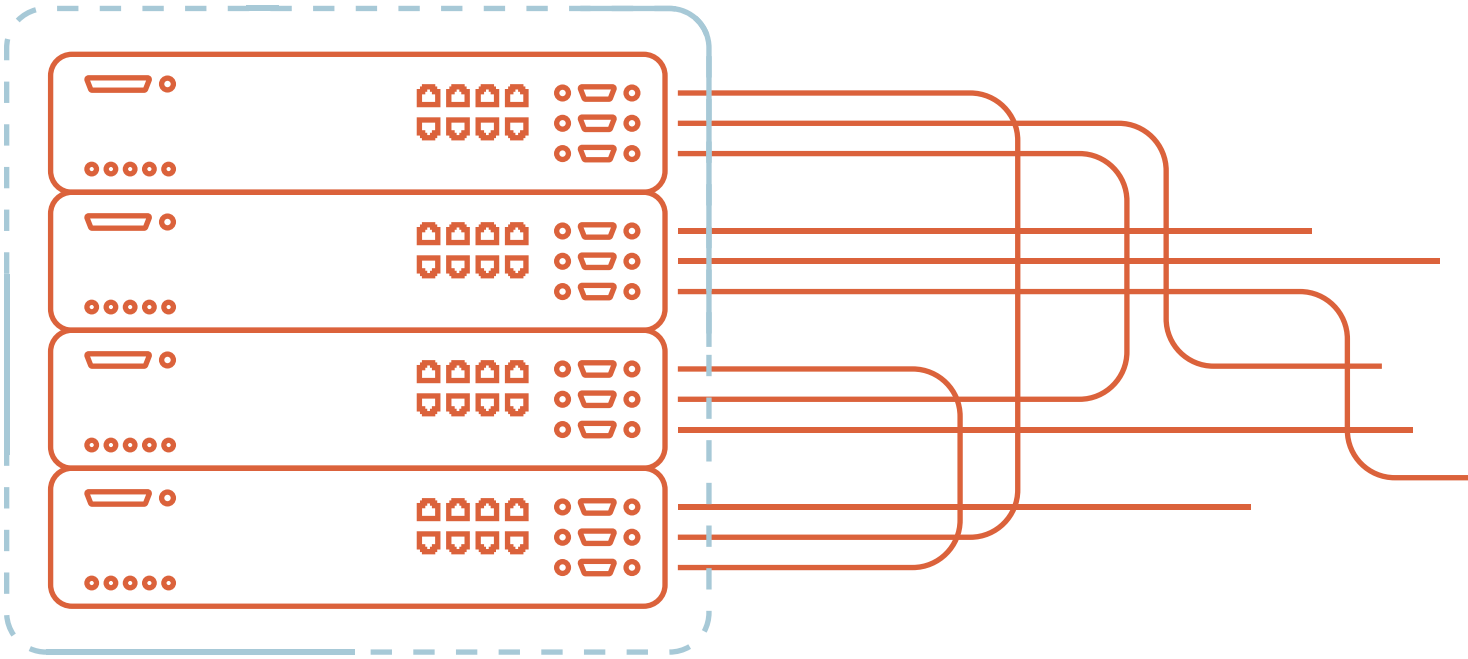
4. Eliminate downtime with improved redundancy

Open networking stacks are more reliable than the legacy systems they replace, offering improved redundancy for a couple of reasons. One is the use of a higher-reliability chassis with redundancy features built in. Such switches suddenly become more affordable given that organizations can typically purchase two modern white box switches for automatic fail-over for less than the price of one heavily-discounted switch from a legacy vendor. The other factor is that the disaggregated network concept, when used with an appropriate NOS, enables the deployment of a leaf-spine network architecture throughout the enterprise — not just in the data center. The leaf-spine architecture provides improved redundancy and availability, because every leaf switch has a direct connection to every spine switch.

5. Ease of use & automation

An open networking stack built on Linux makes managing the network familiar to those acquainted with Linux servers, including zero-touch provisioning (ZTP) and automated licensing. Once a switch is physically connected to the network, ZTP enables the automation of provisioning and configuration processes, typically using a Dynamic Host Control Protocol (DHCP) server.

ZTP automations also take advantage of familiar, open source Linux tools, such as Ansible, Puppet, and Chef, which began life as tools to automate server configuration tasks. These tools have now been adapted to provision switch configurations by the open source community. So, just as racks of servers and virtual machines are added to a cluster using Puppet or Chef, network switches and routers can be configured in the cluster by the same tools.



Is open networking right for you?

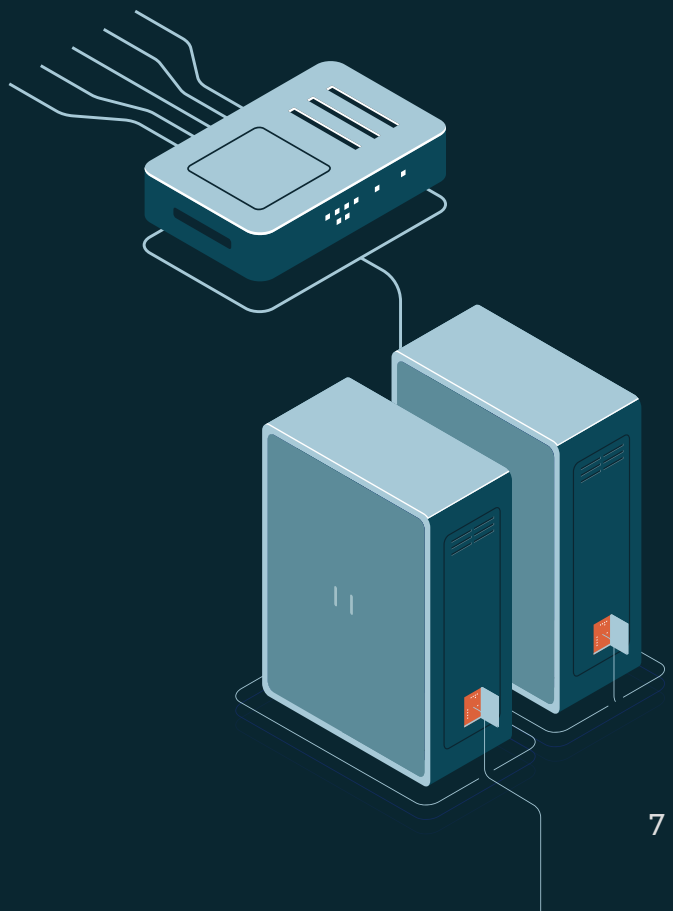
Historically, white box or open networking favored data centers, where its leaf-spine architecture is ideal for handling east-west traffic; however, next-generation, open architecture extrapolates the leaf-spine concept from the data center and implements it across the entire enterprise, including campus locations.

If the following goals appear in your roadmap or organizational priorities, it's time to consider making the switch to open networking:

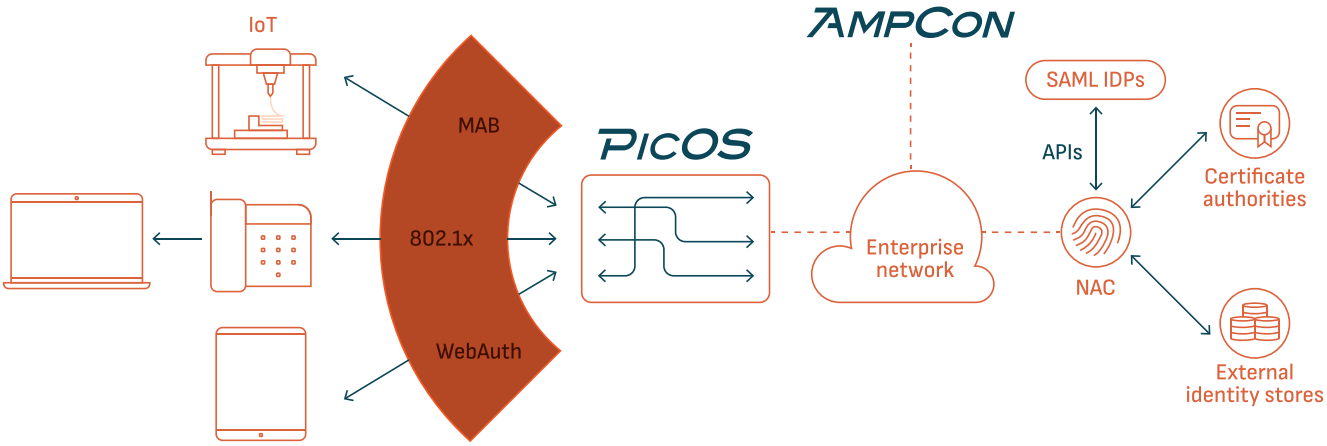
1. Eliminate the need for large, expensive switch chassis with long and unreliable wait times
2. Manage switches with less operational overhead
3. Easily deploy and update the same configurations across campuses, not just in the data center
4. Maintain continuous uptime with power-over-ethernet (POE) switches and automatic rerouting
5. Improve bandwidth utilization
6. Harden network security at the access layer with seamless Network Access Control (NAC) Policy Manager integrations

The open networking movement is now proven to be just as beneficial to enterprise networks as virtual servers were when they first came on the scene. It delivers dramatically simplified network deployment, operations, and support while unlocking increased flexibility at lower costs with simplified deployment and management.

Industry leaders are investing in a network operating stack with resilient, open architecture that can manage and operate thousands of switches at scale, from the data center to the edge — no longer dictated by big-box vendor timelines.



Pica8 Software Platform



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About Pica8

With 1,000+ customers across 40 countries, Pica8 has been designing, deploying, and supporting disaggregated networks for more than a decade. Pica8 offers Linux-based open networking tools that transform even the most complex network into one that is secure and easy to deploy, manage, and protect. Pica8 delivers industry-leading service that ensures the personalized and prompt support no big-box providers can match.

Meet Pica8 →

PicOS

PicOS is a bare metal networking operating system built on a stable, unmodified Debian Linux stack. PicOS delivers highly resilient, highly reliable, programmable networks that are leaner and more scalable than their monolithic predecessors.

Learn more →

AmpCon

AmpCon is a network controller that prevents misconfigurations and downtime with end-to-end networking lifecycle management, complete with automated provisioning, maintenance, compliance checking, and upgrades.

Learn more →