

# Efficiently Scale with Next-Gen Converged Platforms

## Nutanix

The Nutanix Web-scale converged infrastructure combines compute and storage into a single system for all virtualized workloads, eliminating the need for traditional storage arrays.

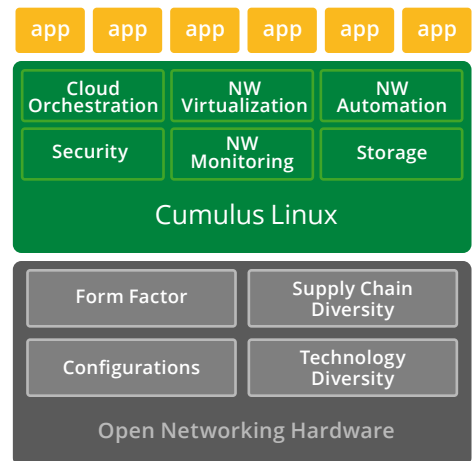
Nutanix has embraced a highly distributed software model, implemented on clusters of x86 hardware. The Nutanix platform brings the same Web-scale concepts that enable enterprise IT for the world's largest data centers. The result is linear scaling and enterprise resiliency, maintaining performance and availability as your system grows. Modular, converged building blocks (nodes) allow data center managers to start small and scale seamlessly to support future growth.



## Cumulus Linux

Cumulus Networks® changes the paradigm of networking, empowering customers to build a modern, scalable data center with general-purpose commodity hardware and high quality software support for production grade deployments. Cumulus Linux is the first full-featured native Linux operating system that embodies the disaggregated model of providing customers with choice in networking switches. Being Linux, it also provides operational flexibility and is a key element in the model of extracting simplicity, supporting layer 2 switching and layer 3 routing protocols, including OSPF, BGP and others.

Cumulus Linux software is built on an open framework with multiple open source components including Quagga as the routing protocol suite. Compared to the traditional black box architectures, the community is able to develop, build and innovate faster on Cumulus Linux. Cumulus Networks carries an approved hardware compatibility list, providing customers with freedom of choice as well as freedom from vendor-lock in, premium costs and custom ASICs. Customer deployments range from small businesses to large Web-scale production workloads as the functionality of Cumulus Linux can be extremely cost-effective across different segments and businesses. The solution includes support for traditional multicast topologies, but more importantly includes support for a unicast VXLAN service node for BUM (Broadcast, Unicast and Multicast) flooding.



## Business

- The shared vision of Nutanix and Cumulus Networks to build on the latest industry standard hardware platforms and have the intelligence distributed in software creates a complementary solution through a new model of converged architectures with faster feature velocity to address issues with private and public clouds.
- In our joint solution, IT can mix various Nutanix nodes over the flexible Cumulus Networks physical fabric. Customers gain the flexibility to design based on the desired virtualized workloads.
- The use of software-based models provides huge data center economics, giving customers a lower CapEx to work with while planning their IT budgets.
- With the ability to customize, simplify and leverage open standards working with Cumulus Linux, customers can plan for architectures to scale without performance bottlenecks.

## Joint Solution

Converged solutions tightly integrate compute (servers), network and storage resources into a single platform. Because infrastructure in data centers today can be built entirely with off-the-shelf, reliable hardware components, they are highly cost-effective.



## Technical

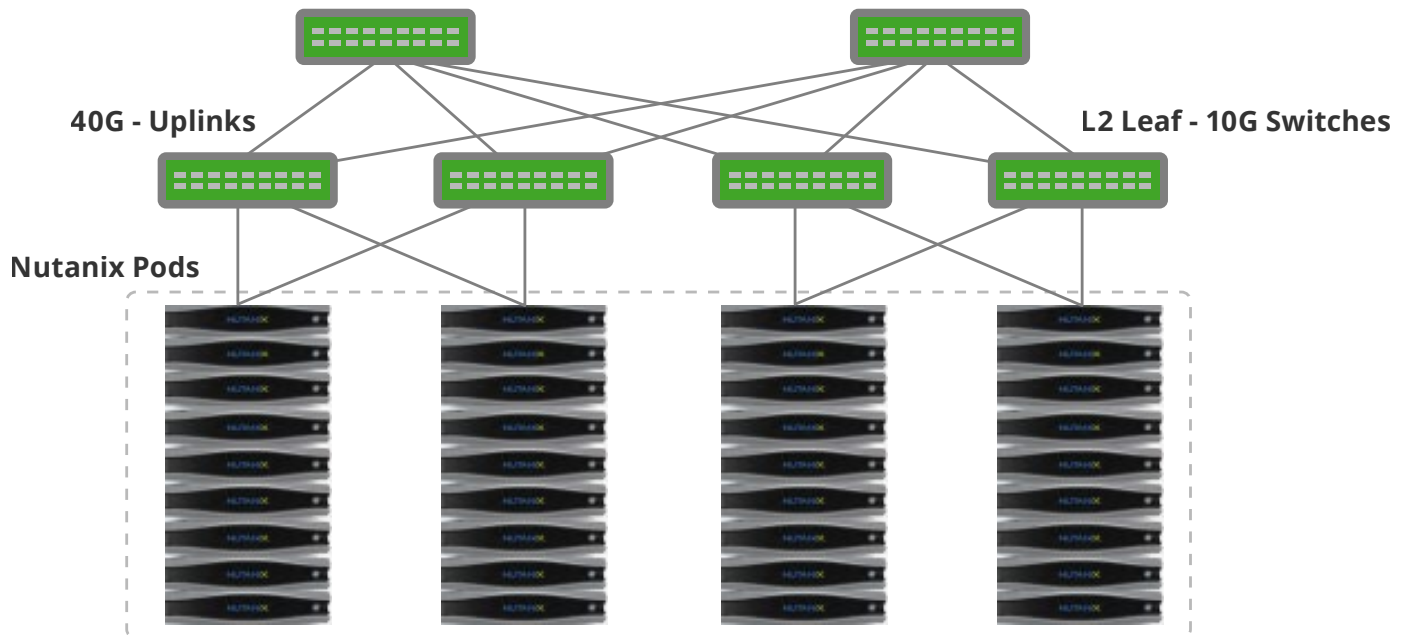
- Designed for true linear scaling, we leverage a leaf/spine network architecture. A leaf/spine architecture consists of two network tiers: an L2 leaf and an L3 spine (Trident 2-based) 40GbE and non-blocking switches.
- Below is a design of a scale-out leaf/spine network architecture, which showcases the Cumulus Linux running on a ToR switch as a leaf and an aggregated L3 spine switch with simplified networking protocols.
- The choice of 1G/10G/40G hardware from a huge list of industry-standard hardware with Broadcom chipsets, x86 or PowerPC CPUs provides customers with flexibility when it comes to building their infrastructure with Cumulus Linux.
- The different Nutanix models with different combinations of CPUs, memory, local flash and disk drives can be combined in the same cluster using standard 10GbE, enabling IT to consolidate different workloads on a single Web-scale converged platform.
- Each node runs ESXi, Hyper-V or KVM, and a Nutanix controller VM (CVM). The CVM handles all data I/O operations for the local hypervisor and connects the node to rest of the Nutanix cluster with features such as dynamic data tiering and tunable redundancy.
- The Nutanix platform also offers VM-centric management, including VMCaliber data protection and disaster recovery as well as deep insight into compute, storage and VMs.

## At a Glance

- **Capacity Optimization:** High performance, scale-out platform for your Hadoop deployments.
- **Predictable, linear performance and capacity:** Start small and scale up one node at a time, with racks of single or dual-attach switches based on the workloads.
- **Extremely fast time to value:** Nutanix and Cumulus Linux with a big data application can be up and running in a fraction of the time of traditional infrastructure.

The figure shows how the Nutanix PODs could scale from a single to multiple PODs without performance penalties with the agile architecture of the Cumulus Linux software.

### L3 Spine - 40G Switches





## Conclusion

By integrating data center intelligence into software instead of hardware, and eliminating the black box vendor lock-in network infrastructure, data center innovators have been able to realize both massive scale and rapid feature velocity.

It also helps customers achieve desired data center economics when considering hardware upgrades, to migrate easily and adopt the benefits of next-gen technologies and software feature sets at a faster pace with greater agility.

### Turnkey solutions decrease IT cost

Partnering with a single vendor for a converged design provides you the ease of deployment and expertise desired for configuration, management, and maintenance tasks. Minimizing that overhead lowers OpEx. Purchasing fewer systems decreases your data center footprint, which reduces power usage and cooling expenses. Turnkey solutions enable data center build-outs that are dramatically faster than what's possible with legacy architectures.

### Flexible scalability supports business growth

Scaling on-demand means that you don't have to over-provision to ensure that you can meet requirements in the future. The Nutanix and Cumulus Networks solution lets you deploy the infrastructure that you need today and boost your compute, network and storage resources incrementally as your business grows.

### Software-driven agility accelerates time to value

A virtual data center must be agile, able to provide new services on demand to keep pace with business needs. Vendors of legacy hardware-centric systems often cannot release new features quickly because their architectures depend on custom ASICs or other specialized hardware. IT teams that avoid investments in hardware-centric technologies can optimize time to value for new data center services with the feature velocity driven by Cumulus Linux.

### Predictable price and performance drive reliable ROI

Intelligent, distributed software architectures ensure that performance can scale in a linear fashion. Performance does not degrade with increasing compute demands, layer 3 (leaf/spine) Clos architectures, or storage capacity.

Converged solutions deliver server, network and storage resources that are pre-configured to work together. That setup minimizes the risks of building and scaling an enterprise data center, and creates a predictable cost model. Data center managers can predict future build-out expenses, so they can estimate return on investment (ROI) with confidence.

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## About Cumulus Networks®

Cumulus Networks demystifies the complexity of networking and enables better, faster, easier networks to support your business. Our network operating system, Cumulus® Linux®, allows you to build and operate your network with the mindset of web-scale pioneers like Google and Amazon, radically reducing the costs and complexities of modern data center networks. More than 400 organizations, including some of the largest-scale data center operations in the world, run Cumulus Linux. Cumulus Networks has received venture funding from Andreessen Horowitz, Battery Ventures, Sequoia Capital, Peter Wagner and four of the original VMware founders. For more information visit [cumulusnetworks.com](http://cumulusnetworks.com) or follow [@cumulusnetworks](https://twitter.com/cumulusnetworks).

## About Nutanix

Nutanix delivers Web-scale converged IT infrastructure to medium and large enterprises with its software-driven Virtual Computing Platform, natively converging compute and storage into a single solution to drive unprecedented simplicity in the data center. Customers can start with a few servers and scale to thousands, with predictable performance and economics. With a patented elastic data fabric and consumer-grade management, Nutanix is the blueprint for application-optimized and policy-driven infrastructure. Learn more at [www.nutanix.com](http://www.nutanix.com) or follow up on Twitter [@nutanix](https://twitter.com/nutanix).

## Get Started!

For more information, visit [www.nutanix.com](http://www.nutanix.com) and [cumulusnetworks.com](http://cumulusnetworks.com)

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