Maximize Hybrid Multicloud Performance and Benefits with Nutanix™ and Badu Networks' WarpVM™

WarpVM Features

- Boosts cloud network throughput and application performance by 2-10X or more. [2]

- Leverages patented technology to overcome the root causes of poor performance at a small fraction of the cost of expensive VM and network upgrades that rapidly lose their effectiveness.

- Installs in minutes on AHV, similar to other industry standard platforms such as AWS, Azure, Google Cloud, VMWare and KVM.

- Runs under the control of Nutanix's AHV hypervisor and Prism Management Interface.

- No mods to client or server applications, and no additional hardware or software is required on-premises.

- Delivers the same benefits for all traffic– encrypted, unencrypted, and compressed, unlike legacy optimization tools that require payload access.

- Ideal for real-time streaming, IoT, VDI, DaaS, SaaS, edge cloud and multicloud applications that require fast, reliable large data transfers.

IDC estimates that by the end of 2022, over 90% of global enterprises will have moved from relying on a single cloud provider, to an infrastructure strategy based on a mix of multiple public cloud and legacy in-house platforms. [1] Their goal is to eliminate cloud vendor lock-in so they can:

- Dynamically shift data and workloads across multiple public cloud and on-premises environments in near real-time to leverage relative price and performance advantages. Organizations are no longer willing to be constrained by the cost structures and technical limitations of a single cloud vendor.

- Mitigate risk. Whether due to hacking, natural disasters, technology failures, or human error, a multicloud strategy can significantly reduce the level of exposure imposed by relying on only one cloud provider.

- Improve global availability and performance across all locations, by making it possible to pick the best public cloud vendor for each location.

Despite the potential benefits, three major pitfalls stand in the way:

- Operational complexity. The more vendors in your technology stack, the more challenging it is to maintain. Complete visibility and control become extremely difficult if not impossible without the right tools to achieve a unified management plane.

- Inadequate security. While using multiple cloud vendors can eliminate the single point of failure resulting from relying on only one cloud provider, it also increases the attack surface by exposing more potential vulnerabilities.

- Inability to maintain performance that meets SLAs across a distributed cloud environment. Cloud administrators typically try to overcome lagging performance with repeated and expensive VM and network upgrades. These upgrades rapidly lose their effectiveness because they don't address the root causes. This often leads to significant over-provisioning, contributing to major cost overruns that analyst firm Gartner says will impact more than 60% of cloud projects. [3]

All these pitfalls can be avoided by implementing the Nutanix™ Cloud Platform with Badu Networks' WarpVM. Nutanix reduces operational complexity and security risks with its AHV hypervisor and Prism infrastructure management solution, both included with the Nutanix Cloud Platform. AHV provides a layer of abstraction from the technical details of each cloud environment, making it possible to span multiple public and private clouds while treating them as one highly available storage system. With Prism, the hybrid multicloud environment can be securely managed and monitored through a single pane of glass. These capabilities are the reason Gartner and other industry analysts consistently recognize Nutanix as a market leader in the hybrid multicloud space.

To address performance challenges, the Nutanix™ Cloud Platform does provide features that optimize CPU usage and storage access across a hybrid multicloud deployment, along with many other capabilities. However, there is still an underlying cause of poor network and application performance impacting all cloud environments that needs to be addressed – the massive amount of packet delay variation (PDV) , more commonly referred to as jitter, inherent in cloud networked environments. Random scheduling conflicts and hops between virtual and physical subnets combine with hosted web, streaming and IoT applications that send data in unpredictable bursts to generate enormous amounts of jitter. RF-induced jitter from last-mile mobile and Wi-Fi networks on the client side compound it. TCP, the dominant network protocol used by AWS and other public clouds interprets jitter as a sign of congestion. It responds by slowing traffic to prevent data loss, even when the network isn't saturated and plenty of bandwidth is available. Just modest amounts of jitter can cause throughput to collapse and applications to stall.

AHV-validated WarpVM overcomes jitter-induced throughput collapse by leveraging Badu Networks' patented WarpEngine™ technology at its core. This enables WarpVM to determine in real-time whether jitter is due to congestion, and prevents network throughput from collapsing and applications from stalling when it's not. WarpVM builds on this with other performance enhancing features that benefit not only TCP, but also UDP and other traffic sharing a network, regardless of protocol. These additional features include packet prioritization, and flow control that accelerates network traffic by making optimal use of all available bandwidth.

As a result, WarpVM boosts cloud network throughput and application performance by 2-10X or more [2] depending upon the volume of traffic, latency and jitter present in the network and cloud environments it's deployed in. WarpVM achieves these results at a small fraction of the cost of VM and network upgrades, eliminating the risk of budget busting over provisioning.

WarpVM installs in minutes on AHV as a VM-based transparent proxy, similar to other industry standard platforms such as AWS, Google Cloud, Microsoft Azure, VMWare, and KVM.
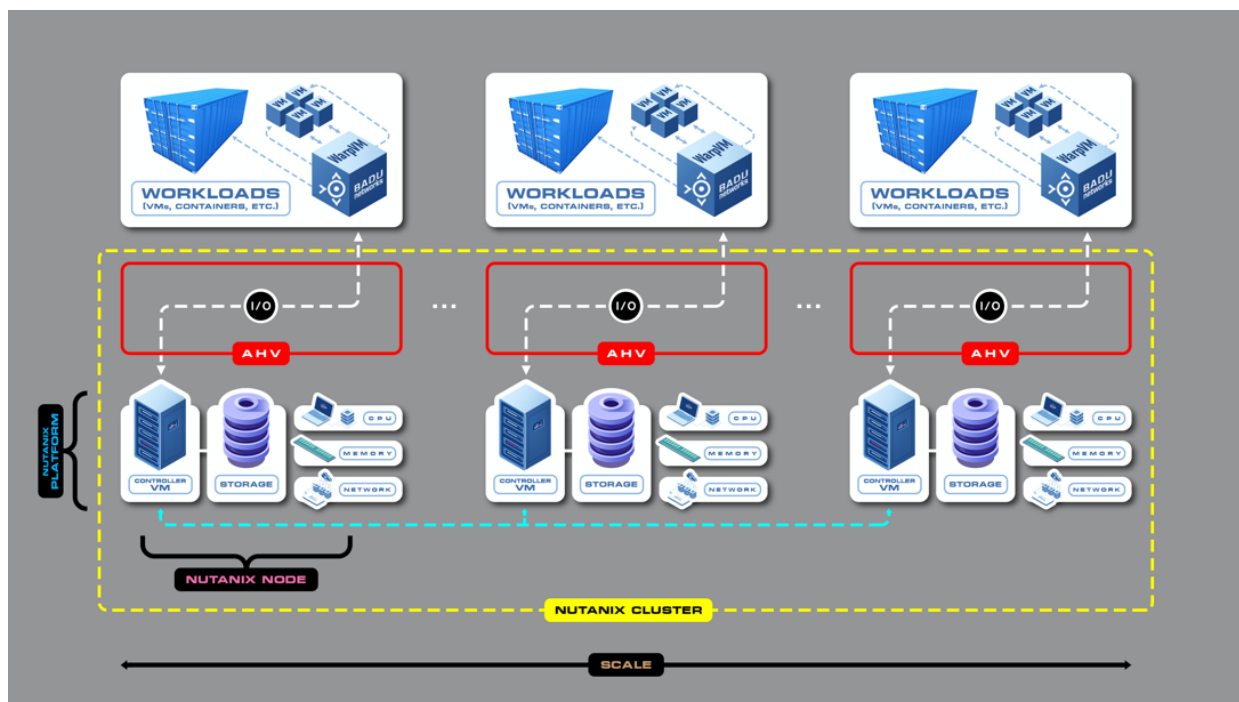
As shown in the image above, one instance of WarpVM is installed with each instance of AHV in the Nutanix hybrid multicloud environment. WarpVM operates under the control of the same management, monitoring, security, backup and disaster recovery features as other applications running in VMs or containers on Nutanix cluster nodes.

No modifications to client or server applications are required, and no other hardware or software is needed on-premises. The only modification necessary is to the on-premises DNS server so that it points to the WarpVM proxy IP address as the destination, instead of the IP addresses of the VMs or containers hosting the target applications. This enables WarpVM to optimize traffic before forwarding it to and from the target cloud applications.

Key WarpVM Features

- Delivers 2-10X or greater improvements in cloud network throughput and hosted application performance.[2]

- Installs in minutes as a VM-based transparent proxy on Nutanix™ AHV, similar to other industry standard platforms such as AWS, MS Azure, Google Cloud, VMWare, or KVM.

- Runs under the control of Nutanix's AHV hypervisor and Prism Management Interface like any other VM or container-based application deployed in a Nutanix cluster.

- Allows packets to be prioritized, and accelerates traffic between cloud and on-premise environments by filling unused gaps in bandwidth to keep traffic flowing.

- Delivers the same performance benefit for all traffic – encrypted, unencrypted or compressed, because it doesn't require payload access for compression and deduplication, unlike other optimization solutions. This eliminates significant performance overhead from random encryption/decryption delays at network endpoints.

- Significantly reduces TCO

   - Single-ended VM-based transparent proxy architecture enables deployment in minutes.

   - Requires no changes to client or server applications.

   - No additional hardware or software needed at the customer site.

   - Eliminates the maintenance overhead and security risk of exposing encryption keys to third party vendor tools at each network endpoint, unlike network optimization tools that require payload access.

Use Cases

- Large Enterprises and SMBs using public or private cloud-hosted applications, as well as hybrid cloud and multicloud implementations.

- Real-time cloud-hosted applications such as live video and audio streaming.

- Edge cloud IoT.

- VDI (Virtual Desktop Infrastructure) and (DaaS) Desktop as a Service Implementations.

- Cloud migration projects and multicloud deployments that require fast, reliable large data transfers.

- Cloud service providers needing better performance to the edge from their PoPs at minimal cost.

- eCommerce sites requiring fast web page load times.

- Content delivery networks.

- SaaS vendors seeking to improve performance.

Technical Specifications*

Max Throughput	2Gbps
Max Sessions	300,000
Form Factor	Virtual Machine
Storage	200GB
Single-Ended	Yes
Optimize Wireless Traffic	Yes
Optimize SSL Traffic	Yes
Optimize VPN Traffic	Yes
Multi-Host Support	Yes

*Note that these specifications are for a default implementation of WarpVM.   Please consult Badu Networks for deployments that require support for greater scalability than the specifications shown here.

Notes

1. IDC Worldwide Cloud 2020 Predictions Report: https://www.nutanix.com/theforecastbynutanix/technology/hybrid-multicloud-interoperability-in-cloud-computing

2. Badu Networks Performance Case Studies: https://www.badunetworks.com/wp-content/uploads/2022/11/Performance-Case-Studies.pdf

3. Gartner: 6 Ways Cloud Migration Projects Go Off the Rails, July 7, 2021: https://www.gartner.com/smarterwithgartner/6-ways-cloud-migration-costs-go-off-the-rails

About Badu Networks

Badu Networks provides patented next generation network optimization technology that delivers dramatic improvements in WAN, mobile, Wi-Fi, broadband and cloud network performance and throughput without costly and disruptive upgrades, enabling our customers to maximize ROI from their existing infrastructure. Our innovative software and appliance solutions significantly reduce webpage load times, accelerate enterprise applications hosted on-premises and in the cloud, and speed traffic across the Internet. Learn more at www.badunetworks.com. To request a free trial contact sales@badunetworks.com.

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