*Warp*VM™

Boost Cloud Performance 2-10X Without Boosting Cloud Costs
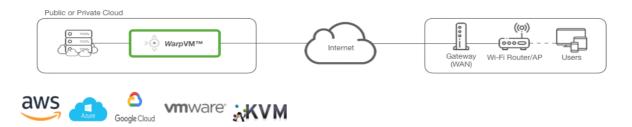
The Challenge

Cloud environments are characterized by: random VM scheduling conflicts, hypervisor packet delays, extra hops between virtual and physical subnets, and encryption/decryption delays. In addition, hosted web, streaming and IoT applications send data in unpredictable bursts. As a result, the cloud generates massive amounts of jitter. Jitter from the cloud is then combined with RF-induced jitter from last-mile mobile and Wi-Fi networks on the client side. Widely used protocols like TCP interpret jitter as a sign of congestion, and respond by slowing network traffic to prevent data loss. Just modest amounts of jitter can cause TCP to slow traffic to the point that throughput collapses and applications stall. This occurs even when the network isn't saturated and there is plenty of available bandwidth. Jitter has become a leading cause of poor cloud network throughput and slow application performance, and its impact will continue to grow.

Slow performance is the new downtime. It can kill productivity and revenue, so it can't be ignored. Cloud administrators typically try to overcome slow performance with expensive VM and network upgrades that don't address the root cause. Instead, these upgrades lead to over-provisioning, resulting in major cost overruns that Gartner and other analysts predict will impact more than 60% of cloud projects.

Jitter's negative impact on cloud application workloads goes undetected by even the most sophisticated cloud management and monitoring tools, and there's only one solution that overcomes it.

The WarpVM Solution

Only WarpVM leverages Badu Network's breakthrough WarpEngine™ technology to boost cloud network throughput and application performance by up to 80% under normal operating conditions, and 2-10X or more in high traffic environments, at a fraction of the cost of VM and network upgrades. It achieves these impressive results by eliminating the negative impacts of jitter, in combination with other performance enhancing features.

WarpVM is a VM-based single-ended, highly efficient transparent proxy that deploys in a matter of minutes in AWS, Google Cloud, Microsoft Azure, VMWare, or KVM environments. No modifications to client or server applications are required, and no other hardware or

software is needed at the customer site. WarpVM is ideal for high performance enterprise cloud, hybrid cloud, multi-cloud, and edge-cloud IoT deployments operating under tight budget and time constraints.

Key Features

- Eliminates wasted bandwidth and keeps throughput high for all traffic by managing TCP's reaction to jitter, regardless of whether the source is the network or the cloud environment.

- Allows TCP & Non-TCP (e.g., UDP) packets to be prioritized.

- Accelerates packet transmission with speed matching and opportunistic bursting, filling unused gaps in bandwidth to keep traffic flowing.

- Delivers the same performance benefit for all traffic – encrypted, unencrypted or compressed, unlike tools that require payload access for compression and deduplication.

- Because it doesn't need payload access, WarpVM eliminates random encryption/decryption delays at endpoints that slow performance and increase jitter.

- Significantly reduces TCO

  - Single-ended transparent proxy architecture deploys as a VM 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 3rd party vendor tools at each network endpoint, unlike solutions that require payload access.

WarpVM has also achieved Nutanix Ready certification for compatibility and performance with their AHV hypervisor. AHV is at the heart of Nutanix's hyperconverged infrastructure (HCI) platform. With Nutanix HCI, hybrid multi-cloud solutions can be deployed across multiple public and private clouds with continuous availability, and none of the complexity. Gartner and other industry analysts have consistently recognized Nutanix as a market leader in the HCI space**.**

Use Cases

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

- Edge-cloud IoT.

- Cloud migration projects and multi-cloud deployments that require fast, reliable large file transfers.

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

- eCommerce sites requiring fast web page load times.

- Live video streaming and video on demand (VOD) service optimization.

- Content delivery networks.

- SaaS vendors seeking to offer premium performance packages.

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.

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.