

10 REASONS

YOUR NETWORK NEEDS *WarpENGINE*™

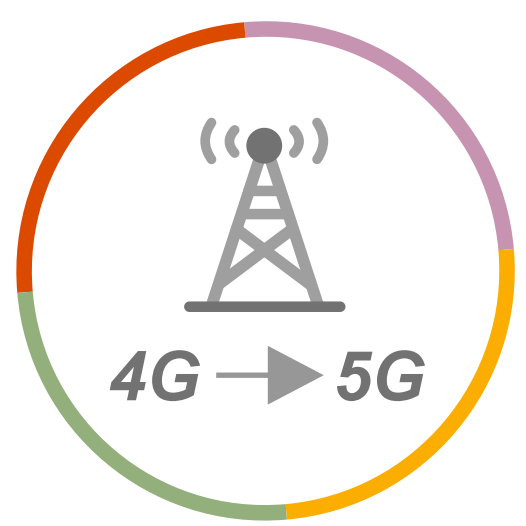
*Required Technology for Today's Network and Application Environments
Your Business Might Not Survive Without It*

1 Only *WarpEngine* Boosts Throughput 2x-10x or More for TCP, UDP and All Other Traffic on WAN, Wi-Fi and Mobile Networks, at a Fraction of the Cost of Upgrades



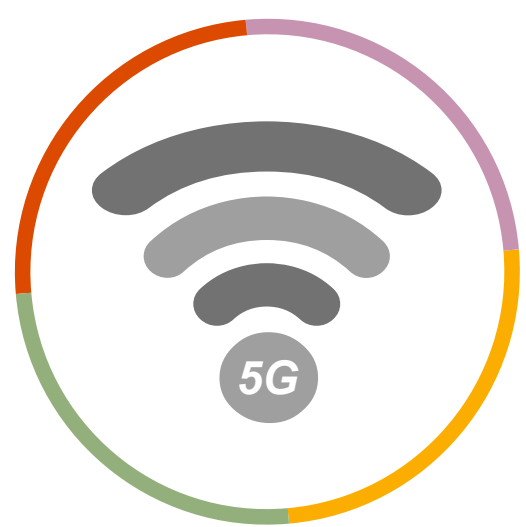
Packet delay variation (PDV), more commonly referred to as jitter, is now the leading cause of poor network throughput. Today's streaming, IoT and web applications that transmit data in unpredictable bursts, cloud environments subject to VM scheduling conflicts and random hypervisor delays, and volatile last mile wireless links all combine to produce unprecedented levels of jitter. TCP, the most widely used network protocol treats jitter as a sign of congestion, retransmitting packets and throttling traffic to prevent data loss until throughput collapses and applications stall, even when plenty of bandwidth is available. Consequently, bandwidth is wasted and performance for all network traffic suffers regardless of protocol. The impact on productivity, customer service and revenue can be devastating. Only *WarpEngine* recaptures this wasted bandwidth by eliminating jitter-induced throughput collapse, and provides other features that deliver 2x -10x or greater improvements in throughput for TCP, UDP and all other traffic on existing WAN, Wi-Fi and mobile networks. By eliminating the root cause of poor throughput, *WarpEngine* delivers far better results than network upgrades, at a fraction of the cost.

2 Only *WarpEngine* Enables MNOs to Control the Timing and Cost of Rolling Out 5G



Jitter from RF interference, fading and channel access conflicts cause throughput to collapse in today's LTE networks. Busy high-speed, small cell 5G networks are likely to see more jitter-induced throughput collapse than ever, despite dramatic increases in bandwidth. Test results show *WarpEngine* boosts LTE network throughput by 2x-3x or more in busy mobile cells, with similar improvements for 5G. This means *WarpEngine* can help MNOs control the timing and cost of 5G rollouts by: 1) dramatically improving service and maximizing ROI from existing LTE networks that will provide the backup for 5G for years to come; and 2) reducing the number of 5G cells MNOs need to deploy by recapturing bandwidth that would otherwise be wasted due to jitter-induced throughput collapse.

3 Optimize Wi-Fi Today and 5G FWA Tomorrow



Actual user experience in a Wi-Fi network is almost always impacted by RF interference, fading and channel access conflict that create jitter across the entire network path from the origin server, causing throughput to collapse and applications to stall. Only *WarpGateway*, built on the same core technology as *WarpEngine*, filters out the impact of external factors that create jitter in today's home, office or large public Wi-Fi networks to maximize performance and throughput, and will do the same for tomorrow's 5G FWA.

4 *WarpEngine* Delivers an Average Three-Year ROI of 360% With a Four-Month Payback Period, While Avoiding the Time, Cost and Disruption of Network Upgrades



Jitter-induced throughput collapse has nothing to do with available bandwidth. In fact, network upgrades often increase its occurrence. *WarpEngine*'s impressive ROI is driven by its ability to recapture existing network bandwidth otherwise lost to jitter-induced throughput collapse. The resulting boost in throughput leads to improved application performance that drives higher productivity and profits. *WarpEngine* avoids the time, cost and disruption of upgrades, and delivers far better results.

5 *WarpEngine* is the Most Effective Solution for Encrypted Traffic



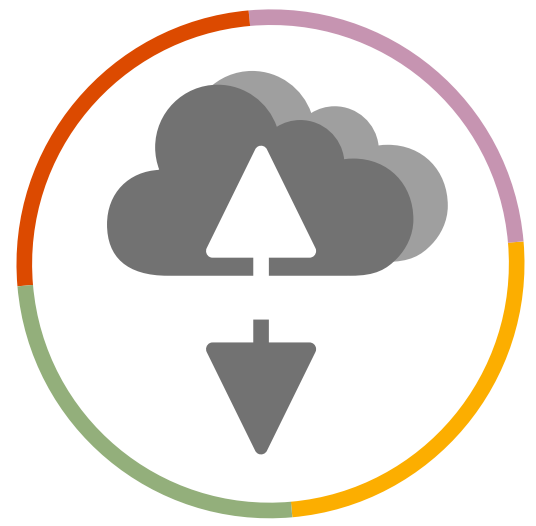
Now that over 80% of internet traffic is encrypted, tools that require unencrypted payload access for deduping and compression offer little value, and often make performance worse than having no solution. They add encryption/decryption delays at each endpoint that increase jitter, and bring the maintenance overhead and security risk of exposing sensitive keys to a third-party solution. Only *WarpEngine*'s algorithmic optimization that requires no payload access eliminates encryption/decryption overhead, along with the security risks and extra maintenance required to support it.

6 Transparent Single Instance Plug-and-Play Deployment Delivers Maximum Flexibility at Minimum Cost



Unlike WAN accelerators that require installation at each endpoint, significant configuration, and continuous monitoring, WarpEngine's technology is plug-and-play. It can be installed at a single location anywhere on the network as a hardware appliance, software module or VM, on-premises, in a cloud provider's environment, a cell tower base station, or between an access point and Wi-Fi router. No client application or server modifications are required and the overhead of supporting hardware and software at multiple locations is eliminated.

7 Boosts Cloud Network Throughput and Hosted Application Performance by 2x-10x or More at Far Less Than the Cost of Upgrades



VM scheduling conflicts, hypervisor packet delays and hosted applications that send data in random bursts create jitter that leads to poor cloud network throughput. Only WarpVM™ leverages WarpEngine's breakthrough technology to eliminate jitter's impact in the cloud, boosting network throughput and application performance by 2x-10x or more, at far less than the cost of VM and network upgrades that don't address the root problem. WarpVM is ideal for: enterprise cloud, hybrid cloud and multi-cloud applications; ecommerce sites requiring fast page loads; CDNs; SaaS applications; video and audio on demand; and live streaming services. WarpVM installs entirely as a VM in AWS, Microsoft Azure, Google Cloud or any other public or private cloud environment. No client software or hardware is required.

8 WarpSDN Leverages WarpEngine's Patented Technology to Deliver SD-WAN that binds multiple links and optimizes them



Most SD-WAN tools make decisions based on measurements at the edge to select the best performing link among broadband internet, dedicated MPLS, Wi-Fi, LTE, 5G or any other network transport - routing the highest priority traffic over the best performing connection at any point in time. While some SD-WAN solutions incorporate WAN optimization that reduces bandwidth usage for some types of traffic, they have little control over what happens after the link is selected. In contrast, WarpSDN takes the extra steps of binding multiple links to leverage their combined bandwidth, and optimizing each link's performance and throughput using patented WarpEngine technology.

9 WarpEngine Is the Enabler for Mobile Edge and Fog Computing



New Mobile Edge and Fog Computing architectures are designed for real-time applications with high speed wireless networks and locally cached content that distant cloud data centers can't effectively support. They also filter traffic between the edge and the cloud. This requires optimization that is both hierarchical and distributed to respond to ever-changing network conditions as traffic moves between layers, especially in short RTT, jitter-prone mobile edge networks used by IoT devices where the impact of RTOs can be devastating. WarpEngine's transparent proxy architecture and ability to locally cache content, combined with WarpSDN to respond to ever changing network conditions, and WarpVM to address cloud virtualization jitter can meet these requirements.

10 WarpEngine is Required for a Complete, Future-Proof Network Optimization Strategy



QoS tools are traditionally used to prioritize traffic and prevent packet loss. However, they can't guarantee performance and throughput in today's jitter-prone network environments where over 80% of the data is encrypted. The move to cloud, and the proliferation of IoT-enabled devices communicating over Wi-Fi, 4G LTE and small-cell 5G networks at the edge will intensify jitter's impact. To address this WarpEngine tackles jitter head-on, algorithmically filtering out its impact to prevent throughput collapse for all types of traffic. With WarpEngine, QoS settings can be relaxed as performance improves dramatically for all users, and you have a complete network optimization solution now and in the 5G future.

