Messaging Accelerator™ 6.0

Achieve Lowest Latency and Highest Throughput for Socket-Based Applications

Mellanox Messaging Accelerator (VMA) is a dynamically-linked user-space Linux library for accelerating TCP and UDP, Unicast and Multicast Traffic.

Applications that utilize TCP sockets as well as UDP multicast and unicast datagrams use the VMA library to offload network I/O processing from a server's CPU. The traffic is passed directly from the application user space to an InfiniBand or Ethernet network interface card (NIC). It bypasses the kernel and IP stack and thus minimizes context switches, buffer copies and interrupts, resulting in extremely low latency and high throughput transport performance.

Mellanox VMA 6.0 delivers sustainable latency under loads of over 3.5 million packets per second and dramatically improves UDP application-to-application latency (RTT/2) to 1.3 microseconds and transparent sockets TCP latency to 1.6 microseconds, over two times better than competitive offerings. Mellanox VMA 6.0, in conjunction

with ConnectX®-3 adapters, delivers the lowest latency and boosts performance for a wide range of finance/trading and Web 2.0 data center applications. As a result, application performance is improved without having to modify application code.

Dramatically Improving the Performance of Financial Market Data

Mellanox Messaging Accelerator boosts the performance of financial market data applications, including NYSE Technologies Data Fabric™, Informatica 29West Ultra Messaging and RTI DDS, cutting latency by as much as 80% and increasing application throughput per server, as compared to applications running on standard InfiniBand or Ethernet interconnect networks.

HIGHLIGHTS

− **PERFORMANCE**
- *Low Jitter*
- *Minimizes latency - Up to 300% faster*
- *Maximized throughput - Up to 200% higher packet rate*
- *Consistent results over thousands of nodes*

− **TRANSPARENCY**
- *No application code changes required*
- *Fully compatible with Linux socket API*
- *Implemented on standard servers*
- *100% compatible with IPv4 wire protocols*

− **CONNECTIVITY**
- *Mellanox's 10/40/56 Gigabit Ethernet or InfiniBand ConnectX-3 adapters*
- *Supports PCI-Ex Gen-3 servers with additional latency and throughput gains*
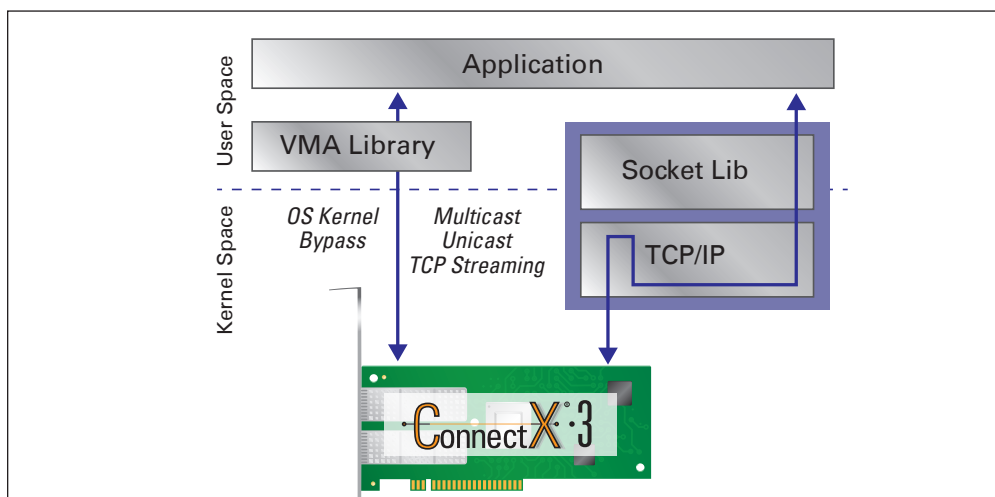

Figure 1. *VMA Block Diagram*

Due to the transparent and high-performance nature of Mellanox Messaging Accelerator, many Multicast and TCP applications with heavy traffic volumes and/or low messaging latency requirements gain a measurable increase in application performance. Ideal candidates for Mellanox Messaging Accelerator include:

– Market data consumption & distribution applications

– High frequency trading and real-time risk management

– Caching/data distribution application

## Increasing Throughput of Cloud and Web 2.0 Applications

As data volumes increase in a variety of enterprises, market segments and applications, Mellanox Messaging Accelerator becomes a popular choice for transparent improvement of Web 2.0 application performance. Mellanox Messaging Accelerator is the ideal choice for enterprises that are seeking a high-throughput packet-per-second (PPS) rate and prefer to avoid code changes or the use of additional hardware units. Notable results are achieved by bypassing the operating system and the TCP/UDP stack. The is also the option to extend beyond standard socket APIs and use zero-copy NIC interfaces to further optimize latency and throughput. Ideal candidates for Mellanox Messaging Accelerator include:

– Memcached - Distributed memory caching system

– Multi-sensor data acquisition processing

– Online content delivery and caching

Scalability with Multi-Core Nodes

In real life, application spans to multiple processes and cores on the same node. An efficient solution has to take this in consideration and sustain performance across processes and cores. Due to the advanced hardware features of ConnectX-3 (such as flow steering and hardware replication), VMA can provide a near-linear performance scalability for multi-core /multi-process applications.

Ordering Part Number	Description
SWL-00400	VMA license per server (2 CPU Sockets)
SWL-00401	VMA license per server (2 CPU Sockets) w/ Mellanox E2E hardware
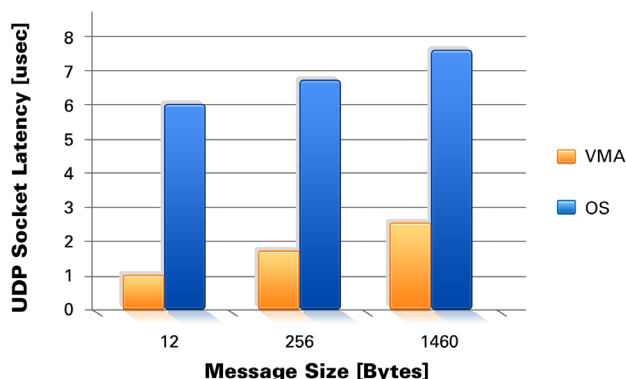
Figure 2. *VMA latency is 3X lower that without VMA (source: sockperf benchmark utility from Google code project test)*
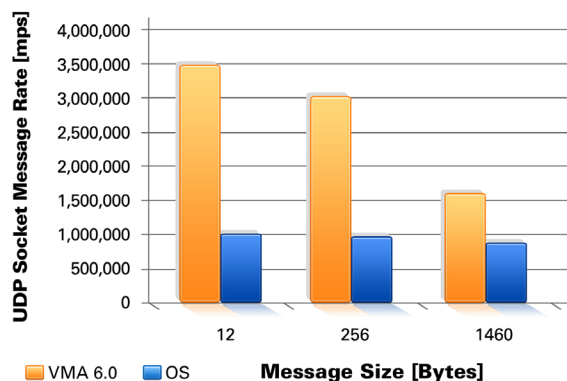
Figure 3. *VMA message rate is 3X higher that without VMA (source: sockperf benchmark utility from Google code project test)*
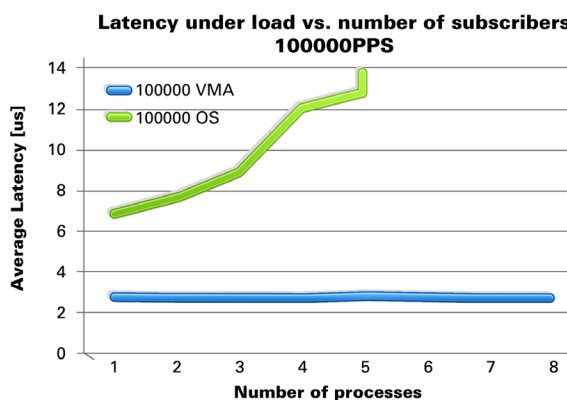
Figure 4. *VMA enables scalability to multiple process on the same node*

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