6WIND SPEEDMATTERS

Application Brief

TCP Termination For HTTP Networking

HTTP has become the underlying protocol for almost all networking applications and HTTP-based RESTful APIs are flourishing everywhere. TCP sockets, the objects used by computer programs to build HTTP applications, haven't changed for decades and have revealed their limits in terms of performance and capacity.

6WINDGate™ packet processing software, which has been selected by many Network Vendors since 2007, includes a TCP Termination module that allows developers to create high performance TCP applications.

6WINDGate-based applications leverage multicore power in such a way that they can reach unprecedented capacity and performance levels on generic hardware platforms or virtual environments.

Vendors can either modify popular open source web servers or proxies, or create entirely new products. For example, with 6WINDGate's TCP Termination module, a high performance web server can be created with less than 500 lines of code.

Requirements For High Performance HTTP Networking

- Benefit from high performance Ethernet interfaces (10G, 40G and soon 100G)
- Leverage dedicated hardware accelerators - hardware crypto-engines, smart Network Interface Cards (NICs) etc.
- High network throughput above 200 Gbps
- Unlimited number of concurrent TCP sessions
- Lightweight Layer 7 transaction processing allowing millions of HTTP transactions per second
- Network link aggregation techniques to accommodate HTTP's highly asymmetric traffic patterns

HTTP Networking Use Cases

Applications based on 6WINDGate's TCP Termination Module

- Web Server
- Media Server
- Static Web Content Delivery Network (CDN)
- Web cache server
- HTTP load balancer
- HTTP proxy
- HTTP security
- Application Delivery Controller

6WINDGate™

Fastest TCP Performance

Up to 5 million TCP Sockets per second

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Packet Processing Software * Outpace The Competition

6WINDGate Solution For High Performance HTTP Networking

6WINDGate's socket programming model has been designed to take advantage of multi-core environments, enabling fully parallel operations for both session creation and data path. Event driven applications can thus directly benefit from hardware load balancing technologies (RSS – Receive Side Scaling) offered by network interface cards. As a result, linear performance growth can be observed as more processor cores are allocated to the application.

6WINDGate's socket API enables either zero-copy operations to deliver the fastest performance or a traditional buffered or vectored I/O model for simplicity of use. Depending on the hardware used, applications can support hundreds of millions of concurrent sessions, several millions of application transactions per second and five million new connections per second.

Traffic patterns can be asymmetric and a factor of 10x between incoming and outgoing traffic is common. 6WINDGate allows aggregating many ports in a bundle where only one port can receive traffic while the others are emit only.

The 6WINDGate acceleration solution is compatible with commercial and open source Linux distributions and does not require any modification of the Linux kernel.

6WINDGate Features for HTTP Networking

6WINDGate builds on the most comprehensive portfolio of data plane protocols on the market including:

- Multicore optimized TCP stack over IPv4 and IPv6 stack leveraging the Data Plane Development Kit (DPDK) and extensions (multi-vendor 10G and 40G NICs, smart NICs and more)
- BSD-like asynchronous event driven API
- Optional zero-copy mechanism
- BSD socket-like API
- Virtual Routing and Forwarding (VRF) support

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Web Server Sample Application

6WINDGate TCP Termination Performance:

- 5 million TCP sockets per second
- 6.5 million HTTP requests per second with 4KB pages
- Over 240 Gbps of application throughput while millions of TCP sockets are opened
- Concurrent active TCP sockets only limited by memory on the system (for example: Over 100 million concurrent sockets with 256GB of RAM)

Reference Platform:

- HP DL580 Server
- Intel® Xeon® Processor E7-4870v2 Series platform with 60 cores running at 2.3GHz
- 28 cores configured to run in the fast path
- 256GB RAM
- 7x40 Gbps Mellanox Ethernet ports

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