



# UltraBand™ 5000 Product Line

Media Caching, Video Acceleration and Content Control

Cluster Computing Video Caching Technology for Service Provider Networks

## UltraBand 5000 Overview

The UltraBand 5000 reduces bandwidth and network infrastructure costs and improves end-user Quality of Experience (QoE) by caching redundant P2P and HTTP traffic within the service provider network. The carrier class product family cost-effectively scales to meet the needs of virtually any provider – from small-scale mobile operators with a few thousand subscribers to large-scale network operators with over a million subscribers – leveraging cluster computing technology to support rapidly expanding multi-gigabit carrier networks.

PeerApp's patented technology eliminates redundant P2P and HTTP traffic by caching popular content, plus it improves end-user QoE by delivering the content to the subscriber at the fastest possible rate. By offering superior end-user video experiences providers can deliver more competitive and successful services.

The UltraBand 5000 supports popular services and applications based on P2P and HTTP protocols. P2P and HTTP represent most of today's Internet traffic. By efficiently caching this traffic providers reduce bandwidth demands and cut infrastructure costs.

P2P support includes BitTorrent, Ares, e-Donkey, Gnutella and Pando. HTTP support includes video streaming services such as YouTube, large video file downloads, and operating system and gaming updates.

The UltraBand 5000 scales from a single cache server (engine) to up to sixteen cache servers, all connected as a unified distributed computing platform. Up to ten very high capacity storage array enclosures function as a single storage area network (SAN) providing a total capacity of 60TB of available caching storage. Cache engine and storage arrays can be added in a modular fashion as subscriber application traffic, bandwidth, and performance requirements increase.

## UltraBand 5000 Product Line Benefits

- ▶ **Lower Bandwidth & Infrastructure Costs**  
Reduce Internet transit and peering bandwidth consumption. Postpone network upgrades.
- ▶ **Accelerated Content Delivery**  
Cache content within ISP network for wire line content delivery. Improve customer QoE. Reduce churn and support costs.
- ▶ **Content Control and Management**  
UltraBand supports flexible content redirection and filtering policies based on the McAfee® SmartFilter categorization engine and built-in redirection capabilities.
- ▶ **New Revenue Opportunities**  
Improved service quality and greater network efficiency enables premium high speed broadband packages and specialized Internet video service offerings.
- ▶ **Cost Effectively Scale for Growth**  
Modular caching and storage elements enable incremental system growth to meet increasing traffic requirements.

## Key UltraBand 5000 Features

- |   |  |
|---|--|
| ▶ <b>Network Optimization</b>               | The only caching solution that provides up to 30% reduction of transit link bandwidth. Defers costly transit and backhaul upgrades.  |
| ▶ <b>Concurrent P2P &amp; HTTP Caching</b>  | Only architecture that can simultaneously support all HTTP and P2P traffic in a single caching solution.   |
| ▶ <b>IP Transparency / Legal Compliance</b> | IP Transparency preserves application logic for P2P networks and HTTP services. The system fully complies with the procedural "safe harbor" provisions set by US (DMCA 1998) and EU laws to protect network operators from liability for routing, caching and hosting 3 <sup>rd</sup> party content. |
| ▶ <b>Content Filtering &amp; Control</b>    | Capabilities to define redirection and filtering policies per classes of content, either explicitly defined or via McAfee® SmartFilter URL categorization engine.  |
| ▶ <b>Wire Speed Content Delivery</b>        | Accelerates delivery of streaming and download content at up to the wire speed of the access network. Enables new revenue-generating services for ISPs.  |
| ▶ <b>High Availability</b>                  | Clustered system architecture with no single point of failure. Hitless software upgrades minimize operating downtime for maintenance. Hot-swappable power supplies and disks.  |



## Key Functionality

### Intelligent Media Caching

Unlike traditional Web caching solutions, PeerApp Intelligent Media Caching handles video, software updates and other bandwidth-intensive content delivered using common P2P and HTTP protocols. In addition, the UltraBand 5000 assesses the value of caching specific content based on its popularity, frequency of use, cost of bandwidth and infrastructure efficiency.

### Simultaneous HTTP and P2P Support

The UltraBand 5000 is a modular platform that simultaneously caches and accelerates YouTube and other types of HTTP streaming video, HTTP-based software update services such as Microsoft Windows Update and P2P downloads. P2P protocols supported include BitTorrent, E-Donkey, Gnutella, Ares and Pando. The UltraBand 5000 architecture provides for the non-disruptive addition and integration of new protocols, applications, and protocol updates.

### Caching Transparency

The UltraBand 5000 operates at Layer 2; does not expose a public IP address to subscribers, HTTP services, P2P networks or third parties; and never operates as a "super-peer." The resulting cache transparency ensures anonymity of the UltraBand 5000 within the service provider network. The system never interferes with the business logic of any Internet application or service, including pay-per-click, peer ratings and conditional access provisions.

Caching transparency guarantees that content served from cache is always up-to-date and available outside of the service provider network. It enables compliance with legislation for service provider liability protection, as defined in "safe harbor" procedural provisions in the US (DMCA 1998), the EU (E-commerce directive 2000) and in other countries who inherited US DMCA through Free Trade Agreements with the United States.

### Clustered Processing and Storage

The UltraBand 5000 leverages cluster computing technology to support large-scale and rapidly growing multi-gigabit carrier networks. The product line scales from a single cache server (engine) to up to sixteen cache servers, all connected as a unified distributed computing platform.

Up to ten very high capacity storage array enclosures function as a single storage area network (SAN) providing a total capacity of 60TB of available caching storage.

Cache and storage servers are interconnected via a high speed Ethernet network using the cost-effective iSCSI protocol.

### Cluster File System

The cluster file system provides complete virtualization of stored content, enabling each cache server to read and write any file to any storage device. By making a large content pool available to each cache server the UltraBand 5000 delivers higher caching efficiency.

Interconnecting separate scalable storage and network processing elements via affordable iSCSI SAN technology lowers system costs and reduces total cost of ownership.

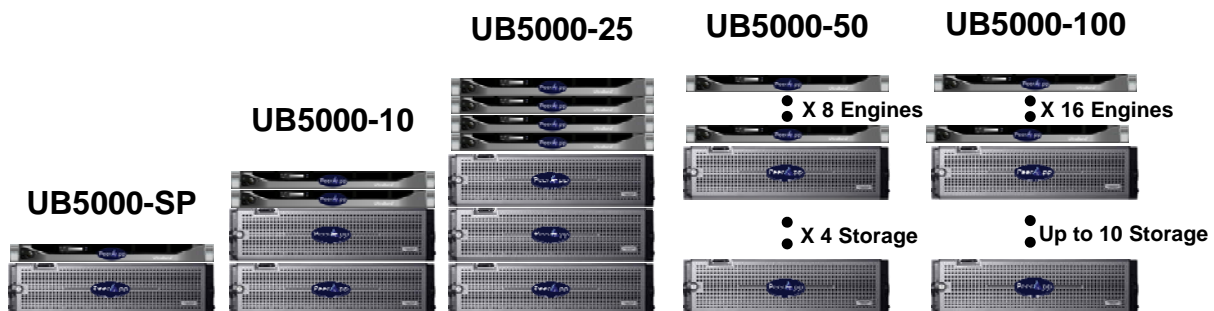
### Carrier Class Availability

The UltraBand 5000 satisfies ISP requirements for high reliability and manageability. The highly available platform supports M+N cache server load balancing and redundancy, and optional RAID storage array mirroring to protect against disk failure.

Software and hardware watchdog functions along with non-disruptive remote software upgrades deliver very high system availability. In the unlikely event of a system failure, Ethernet bypass server technology can be employed to prevent service interruption.

## Scale For Growth

Leveraging cluster computing technology, the PeerApp UB5000 scales from a single server to up to 16 caching engines and 10 storage enclosures to support the needs of small to very large ISPs. Deployed as a single cluster system, the platform delivers simultaneous P2P and HTTP caching and content acceleration within the ISP network.



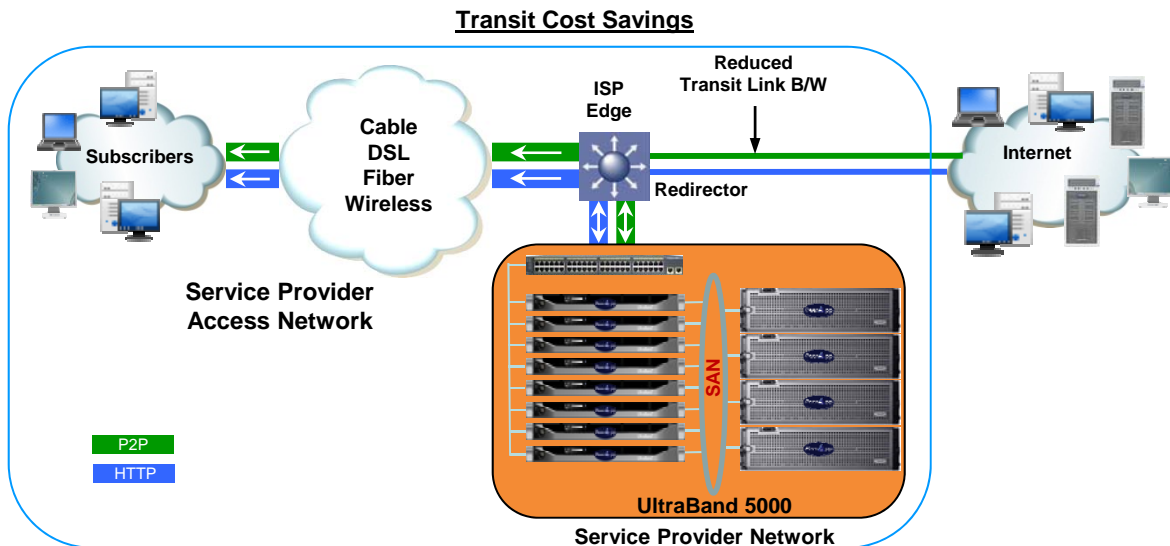
## UltraBand 5000 Deployment Applications

Peer-to-Peer and HTTP video applications represent over two thirds of today's consumer Internet traffic. Video Internet traffic is increasing at unprecedented rates - outpacing ISP network capacity expansion. Expensive transit, peering links and access network links wastefully transport the same files over and over.

### Transit Cost Savings

The UltraBand 5000 eliminates redundant transmissions of P2P and HTTP content over expensive transit or peering links - reducing bandwidth and network infrastructure costs while increasing the bandwidth available for P2P, HTTP and other applications. The PeerApp solution frees up Internet capacity and accelerates content delivery without increasing transit bandwidth fees.

Since cached traffic is served to the subscriber at the fastest speed of the service provider access network, ISPs enjoy higher end-user satisfaction, lower churn and greater adoption of premium broadband packages.



### Content Filtering and Control

The UltraBand 5000 provides a flexible and extensible framework for management, filtering and reporting of Web content. Policies can be set up per groups of content, identified through explicit URL listings or by using URL categorization. The URL categorization services are provided through an integrated McAfee® SmartFilter categorization engine embedded into the UltraBand 5000. The SmartFilter engine recognizes over 90 standard filtering categories as well as customized filtering categories that can be used to group and classify Web content. Content filtering enables service providers to accelerate delivery of Internet video content while blocking undesired content and complying with local regulation.

### UltraBand 5000 UBView - Management and Reporting

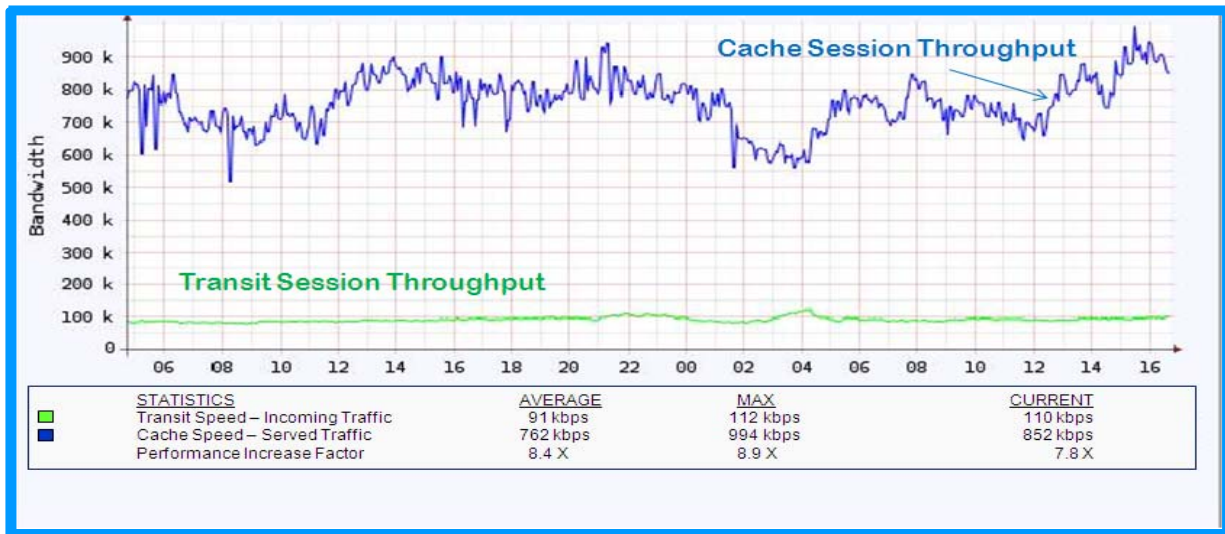
The UltraBand 5000 UBView Web-based management interface provides a comprehensive view of the system and its components, caching engines and storage arrays.

Detailed reports delineate incoming and outgoing (cache served) traffic for each protocol: BitTorrent, eDonkey, Gnutella, Ares and HTTP. Upstream and downstream data can be displayed for a day, week, month or year periods. The average traffic for selected periods as well as minimum, maximum and current (snapshot) traffic is displayed. Traffic into the cache, traffic cached-out (served), byte hit ratios and numbers of (P2P) sessions can be displayed by day, week, month or year. QoE reports display specific HTTP and P2P performance gains for cached vs transit traffic.

System key health indicators such as CPU, memory, system and disk utilization are provided. In addition Cache Detail Reports (CDRs) can be exported for use with 3rd party management and accounting systems.

## UltraBand 5000 UBView – Quality of Experience

The UltraBand 5000 UBView provides Quality of Experience reporting so providers can observe the impact of caching on user experience. QoE reports display specific HTTP and P2P performance gains for cached vs transit traffic. The snapshot below, taken from an actual customer network, shows that cached content is delivered approximately 8 to 8.5 times faster to all online subscribers than content that is simply delivered directly from the Internet.



## Specifications

|                             |  |
|-----------------------------|--|
| Supported Protocols         | <ul style="list-style-type: none"> <li>• <b>HTTP progressive download video services:</b> YouTube, DailyMotion, Google videos, Todou, Youku, MSN Movies, Veoh, Yahoo Video, Metacafe, AOL Video, Stage6.divx.com</li> <li>• <b>HTTP software update services:</b> Microsoft Windows updates, Adobe Acrobat updates, Apple updates, antivirus and gaming updates</li> <li>• <b>Web-based file sharing services:</b> RapidShare, MegaUpload, Badongo, zShare, DL Free</li> <li>• <b>Generic HTTP file downloads</b></li> <li>• <b>Open P2P:</b> BitTorrent, E-Donkey, Gnutella/Gnutella1 and Ares</li> <li>• <b>Commercial P2P:</b> Pando</li> </ul> |
| Unparalleled scalability    | <ul style="list-style-type: none"> <li>• Up to 16 caching engines in a cluster</li> <li>• Up to 10 storage enclosures with up to 60TB storage</li> <li>• Up to 8 million simultaneous sessions</li> </ul>  |
| Configurable cache          | <ul style="list-style-type: none"> <li>• Configurable upstream and downstream caching</li> <li>• Complete control over applied links</li> <li>• Control over Cache output rate</li> <li>• Integration with DPI and other efficiency solutions</li> </ul>   |
| Availability                | <ul style="list-style-type: none"> <li>• M+N redundancy of cache engines</li> <li>• RAID mirroring for storage arrays</li> <li>• Hot-swappable power supplies and disks</li> <li>• Software and hardware watchdogs</li> <li>• Hitless in-service software upgrades</li> </ul>  |
| Management                  | <ul style="list-style-type: none"> <li>• UBView Web based reporting and element management</li> <li>• SNMP v.2 monitoring</li> <li>• CLI-based XML configuration</li> <li>• Serial over IP</li> </ul>  |
| Security                    | <ul style="list-style-type: none"> <li>• Management security: HTTPS-based Web access, SSHv2-based CLI</li> <li>• IP-based ACL for CLI and Web management</li> <li>• Two level CLI authentication</li> </ul>  |
| Content Filtering Framework | <ul style="list-style-type: none"> <li>• Integrated McAfee® SmartFilter URL categorization database</li> <li>• 90+ standard categories</li> <li>• Unlimited number of custom categories</li> <li>• Content requests can be blocked, redirected or allowed</li> <li>• Custom URL lists for YouTube videos</li> <li>• Control access to/from specific Web site or host (user) IP address</li> </ul>  |



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