MACH^5 Acceleration Technology

Blue Coat appliances overcome network limitations to optimize application delivery to users across the distributed organization

Users and their data continue to move farther apart. Sometimes the driver is server consolidation, leaving branch and remote offices with poor performance. Other times, the driver is the growth of data itself, data that must be backed-up, served out and distributed through web services. For all these reasons and more, WAN performance has become a critical choke point in successfully delivering applications to the users that need them.

Each organization's challenge is different, however. Poor file service performance, excessive Internet backhaul, slow SSL encrypted software-as-service applications, growing video use and an inability to use think-client applications over a WAN are but some of the most common problems. Unfortunately, the traditional approach to solving all of them – more bandwidth – is ineffective, because most networks are now bound by a more fundamental limitation: latency.

In response, many IT organizations have begun to evaluate specialized solutions that can accelerate application delivery by overcoming latency and bandwidth will always increase because traffic will always increase. Best we can hope for is something like "bandwith recovery" referring to regaining bandwidth lost to poor WAN management. However, many of these solutions address only part of the overall mix of challenges. Solutions should support all key enterprise business applications – regardless of whether they are webified or not, rich media or plain text, hosted internally or externally, or encrypted or unencrypted. They need to make decisions based on the user, not just the application or source server. In addition, it is important to consider support for future WAN architectures – for example, a mix of MPLS VPNs with direct-to-Internet branch office connectivity.

The Blue Coat Solution

Blue Coat's application acceleration solution, featuring MACH^5 (Multiprotocol Accelerated Caching Hierarchy) technology, enables organizations to accelerate delivery of all key productivity applications – including file services, email/Exchange, Web applications, video, and SSL encrypted web applications. MACH^5 encompasses five acceleration techniques that work in concert – Bandwidth Management, Protocol Optimization, Object Caching, Byte Caching, and Compression.

Blue Coat's Application Acceleration Solution with MACH^5 Technology Enables Organizations to:

Accelerate Business Applications
Limit Non-Business Applications With MACH5, enterprises can accelerate all key business applications – file, e-mail, web, video, secure web (HTTPS), while maintaining complete control over non-business applications (e.g., P2P, IM, Skype) and unwanted network traffic (Spyware, inappropriate Web content, malicious traffic).

Enable Server Consolidation
MACH5 acceleration technology helps centralized applications work. Blue Coat's unmatched policy-based controls ensure that MACH^5 is applied the right way, to the right applications. Thus, organizations can consolidate applications to meet cost and compliance requirements, and still maintain application performance.

Accelerate Encrypted Applications
More and more applications are being "webified," and many of those are hosted (or partially hosted) outside the enterprise. This often means that HTTPS/SSL is a greater portion of overall traffic. Blue Coat's MACH^5 technology can accelerate this encrypted traffic – even when the application is hosted/owned by a third party.
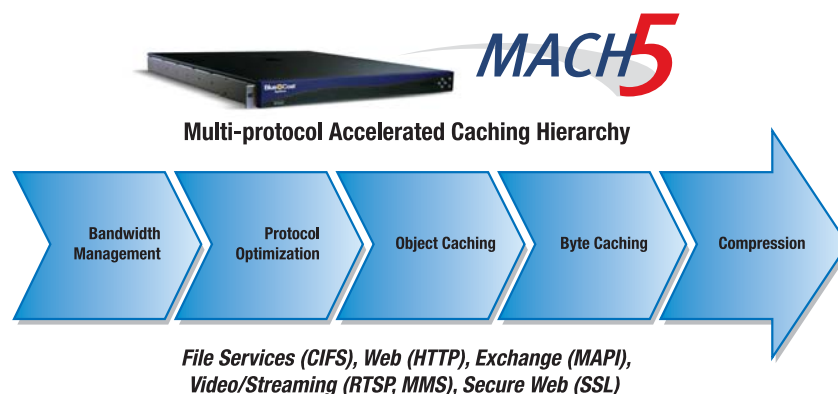
Cache Files Locally
Provide a local copy of not only files, but video and web content as well. No other technology is as effective as local caching for improving user response times and reducing bandwidth. All without the file corruption risks and integration overhead of a wide area file system.

Accelerate Video Applications
For cost and compliance reasons, more and more organizations are turning to multimedia training (streaming/live video, or video on demand), delivered over enterprise networks. Blue Coat's MACH^5 technology accelerates these applications, and minimizes network impact.

Accelerate To The Desktop
Users roam to networks outside of your control. The SG Client with MACH^5 technology provides for a seamless, predictable user experience, even as the underlying network changes. SG Client not only provides accelerated applications directly to the end user, but also logs and reports on the application experience for true, last-mile QOS measurement.

Multi-protocol Accelerated Caching Hierarchy

Bandwidth Management → Protocol Optimization → Object Caching → Byte Caching → Compression

File Services (CIFS), Web (HTTP), Exchange (MAPI),
Video/Streaming (RTSP, MMS), Secure Web (SSL)

Bandwidth Management/Traffic Shaping

This technique assigns a priority to a particular type of application. This priority has an effect both on the order the traffic is sent in, and in the amount of guaranteed bandwidth the application is allocated, regardless of other traffic on the network. This technique ensures that the network is available for the highest priority traffic. Likewise, less important applications can be throttled back and assigned limited bandwidth to help ease network congestion.

Protocol Optimization

Protocol optimization takes protocols that are inefficient over the WAN (e.g., CIFS, MAPI, HTTP, TCP, HTTPS) and makes them more efficient – typically by converting a time-consuming serial communication process into a more efficient parallel process where many communication tasks are handled simultaneously. There are a variety of other optimization techniques, depending on the protocol (e.g., TCP session reuse). While protocol optimization does not reduce the amount of bandwidth an application consumes, it can greatly accelerate delivery of applications and reduce latency in the process.

Byte Caching

Byte caching is as it sounds – caching of repetitive patterns in the byte stream. Byte caching observes repetitive patterns in application traffic, symbolizes those patterns with a token, and sends the token in lieu of the bulky traffic. These tokens are typically only a byte or two, but symbolize blocks of data as large as 64KB. Byte caching is typically not application-specific, and operates at a lower level, optimizing all TCP traffic.

Object Caching

Object caching is very different than byte caching – it is protocol/application specific, and is an all-or-nothing affair. If the cache contains the object, the user is immediately served the object from a local store – virtually eliminating latency and WAN bandwidth consumption. If the cache does not contain the object (or contains an outdated version of the object), then for that particular transaction, a new object must be reloaded into cache and the performance gains are realized the next time the object is requested.

Compression

Compression technology uses a variety of common algorithms to remove extraneous/predictable information from the traffic before it is transmitted. The information is reconstituted at the destination based on the same algorithms. It is effective because performance gains are immediate – the first time something goes through is just as fast as the second. This technique, when applied with byte and object caching as discussed above, helps optimize bandwidth savings and performance. With MACH5, all of these techniques work together to optimize application delivery to remote locations. For example, if the object cache contains an outdated copy of a document, the byte caching capability has patterns and tokens that require only the tokens, plus the changes to be sent. What little is sent is then compressed, and protocol optimized (reducing bandwidth consumed and latency/round trips). All of this is prioritized according the enterprise's preferences, using bandwidth management, such that the important applications get through first with the bandwidth they need.

By combining these technologies into a single solution, Blue Coat MACH5 gives organizations the complete toolkit they need to optimize their entire WAN, covering more application types with more technologies than any other optimization solution.