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White Paper

ZHONE'S MULTIMEDIA TRAFFIC MANAGEMENT SOLUTION

Zhone, the leader of Ethernet-based IP broadband access devices, delivers extremely flexible and powerful Multimedia Traffic Management (MTM™) across its market leading portfolio of MALC and IPD 12000 Broadband Loop Carrier Product Lines.

OVERVIEW: WHAT IS MULTIMEDIA TRAFFIC MANAGEMENT?

Multimedia Traffic Management (MTM) is a system that provides Layer 4 awareness to Zhone's latest generation of BLCs. The development of MTM parallels the industry shift towards IP and Ethernet transport options, as well as the corresponding shift towards multi-service networks that support broadcast video, video on demand, online gaming, and IP telephony applications concurrently. MTM is extremely flexible and configurable — the solution gives the service provider the necessary tools to classify multimedia traffic types, and give those traffic types the priority and control that they require.

Traffic Management is a term that is widely used, and often with varying meanings. Therefore, it is important to define Multimedia Traffic Management prior to explaining Zhone's specific implementation of MTM. MTM is a mechanism through which to identify different classes of network communication — based upon a user, destination or source information, a port, a packet, an application type, or some other defining criteria — and apply special handling to that class so that it is prioritized against contending traffic. It is broken down into three main areas: Application Awareness, or the ability to identify multimedia application traffic at the packet level; Service Delivery, or the ability to effectively deliver an application's traffic in a timely and reliable manner, once it is defined; and finally Traffic Steering, or the ability to dictate where a packet is — or isn't — allowed to go, again based upon application. Together, these components allow MTM to support the addition of virtually any IP application to an access network, opening many new revenue opportunities to service providers.

Traffic management has been largely limited in Ethernet networks to the use of packet prioritization, where a packet is tagged using the IEEE 802.1p standard to define its class. Network devices examine each packet one at a time and queue each packet appropriately so that higher priority packets gain an advantage. This type of prioritization is now extending to the IP layer, so that packets may also be prioritized using information within the IP header of the packet. The result is

Multimedia Traffic Management. Because IP and Ethernet hold a significant advantage in terms of ease of use and cost of ownership, providing Multimedia Traffic Management for these technologies only increases the value of using these technologies within broadband networks.

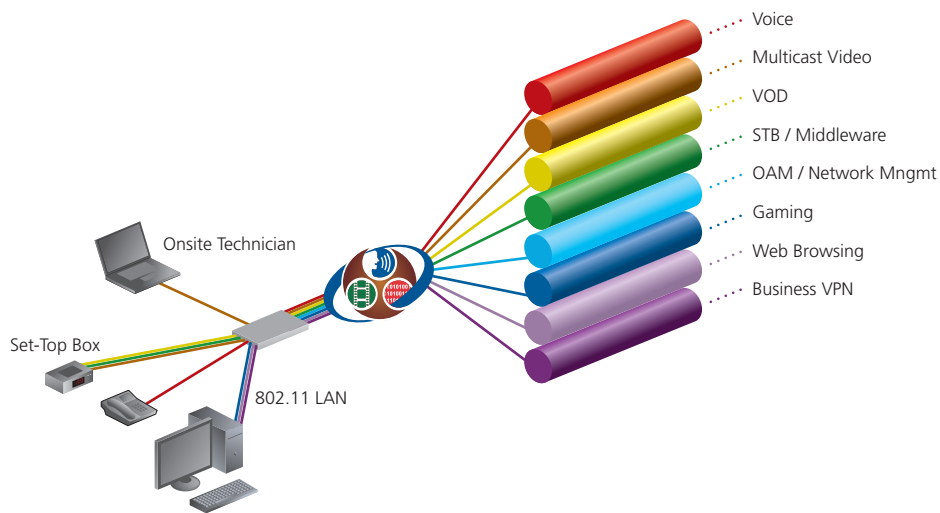
ENABLING NEW SERVICES TO INCREASE SUBSCRIBER REVENUE

The primary benefit of MTM is its ability to support and control any new IP service, allowing Carriers, Service Providers and PTTs to develop new billable services and applications — such as digital video or online gaming — without needing to retrofit the broadband access equipment or undergo lengthy and complex provisioning of their subscriber base. This makes adding new services simple, and the result is that more billable services can be offered — raising subscriber revenue — without also raising operational expenses and IS costs.

MTM is able to do this because it examines packets from the perspective of a Layer 3 switch all the way to Layer 4 — where application information is stored. Using TCP/UDP port filters, IP Address filters, DiffServ, TOS, and 802.1Q/p, MTM has the awareness needed to determine exactly what each packet is being used for, and can make intelligent decisions based upon this knowledge. For example, traffic can be prioritized, throttled back to a set bandwidth limit, or even re-directed into a Virtual LAN (VLAN). The best part is that all this occurs on a single interface, and can even occur within a single VC, making MTM the most powerful and easiest to use traffic management application on the market.

MORE THAN “QOS”

MTM provides much more than what is typically referred to as Quality of Service, or QoS. QoS is concerned with ensuring that critical data is transported first, before other less important data. QoS is also concerned with minimizing latency on important data that might be time sensitive — such as IP Voice. Typically, IP QoS can control traffic by placing each “level” of QoS into its own hardware queue. This solution works, but limits your control to the number of available queues (typically, 4 or 8). Because MTM not only prioritizes traffic, but also controls the upstream and downstream data rates of each application type and can re-direct packets at Layer 2, it overcomes this limitation and greatly expands the boundaries of IP QoS. In the following table, eight applications are mapped to explicit priorities. This is illustrative of traditional QoS. In the second table, applications are shown using MTM. In the second example, many more distinct applications can be managed. In addition, a much higher degree of control is gained using MTM.



MTM makes IP Application Aware, and Applies Traffic Management and QoS where it's really needed.



PROVIDING FRONT-LINE SECURITY FOR THE ACCESS NETWORK

MTM can control or filter traffic based upon Layer 2, Layer 3 or Layer 4 information. This ability allows the BLC to act as a firewall, filtering unwanted or untrusted traffic before it reaches the end-user's modem, or re-directing that traffic to a dedicated third-party firewall device where it can be more closely examined.

MTM also provides the ability to lock MAC or IP addresses to a single port, helping to eliminate CPE device mobility — a term used to describe the theft or misuse of subscriber modems or set top boxes. This same functionality also makes it more difficult to steal the network identity of a legitimate subscriber, further reducing network-related risks within your access infrastructure.

Less risk translates to both lower operational costs and increased revenue — the direct result of improved customer satisfaction, and a greater appeal of your network services to business customers. With a system that appeals to more customers, and with less customer churn due to improved satisfaction, your subscriber base will continue to grow, while your provisioning costs remain flat.



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SUMMARY

Use of the Zhone's Multimedia Traffic Management solution results in a robust, service-enabled network. The benefit of this is very evident: enabling new services means enabling new subscriber revenue. However, while the addition of voice, video, high speed access, online gaming, videoconferencing and other application services is critical to the success of modern telecommunication providers, these same services require very sophisticated networks in order to operate to their potential. By ensuring that each new service can be prioritized, controlled and secured, MTM allows the network to become a supporting factor for a positive business plan; the breadth of subscribers will increase as new services provide a greater appeal to a more diverse clientele, and customer satisfaction will increase overall.



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