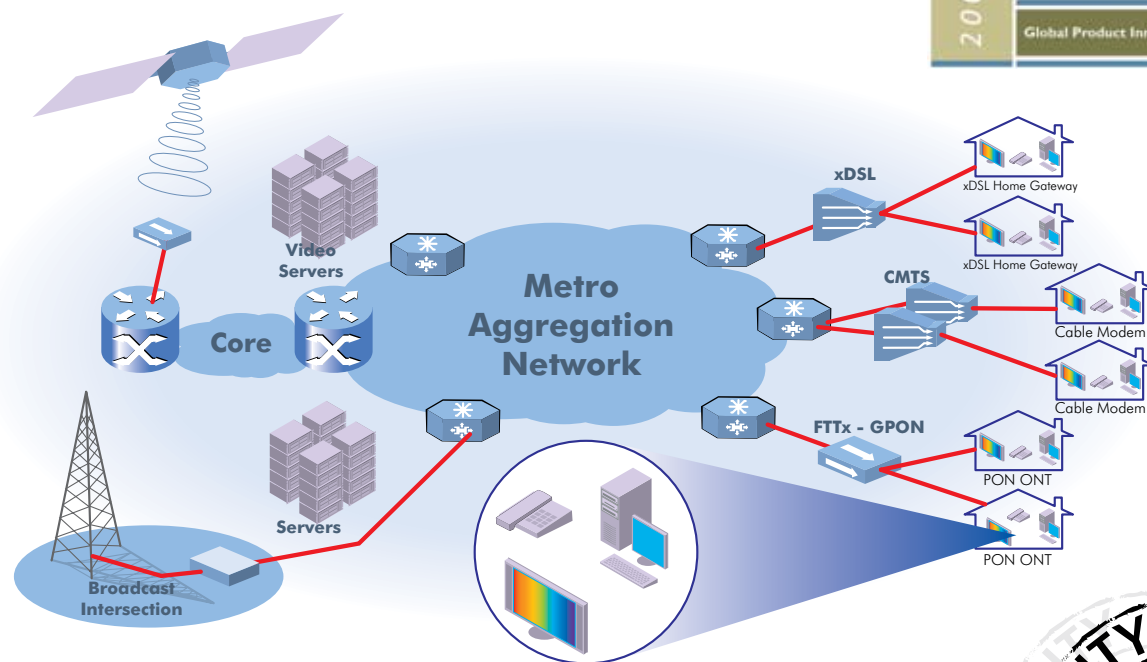# Triple Play - IPTV

Network infrastructure today has become highly evolved and is required to support converged IP applications such as the triple play of video, voice and data. All of these applications have numerous means of implementation and myriad protocols. More emphasis on quality is being placed on communications equipment manufacturers and network providers alike to provide high quality user experience for applications such as IPTV on infrastructure such as xDSL, cable CMTS and next generation FTTx GPON architectures. No longer is it feasible to just provide overall network QoS statistics. Shenick diversifEye™ provides both traditional network QoS and individual end user Quality of Experience (QoE) offering a high degree of granularity right down to an individual home user for IPTV, VoIP and Data applications behind emulated residential gateways.

## IPTV/Triple Play Test Scenarios

IPTV Video Quality - Emulate and analyze a home user's multiple IPTV video streams on a per channel basis with perceptual video quality MOS (Mean Opinion Score) method such as ITU J.144 IP derivative analysis. Determine additional video quality parameters such as blockiness/bluriness.

IPTV IGMP Channel Zap Rate Performance – Emulate an IPTV home user's channel change delay time. Determine on a per viewer basis the length ot time that a typical viewer will experience blank screen during busy hours or channel change surge during a major TV event.

Mixed Triple Play (IPTV, VoD, VoIP and Data Applications) Performance – Emulate and analyze the effect of high VoIP call rates and the cause effect of other high bandwidth applications such as P2P traffic. Test effect of triple play applications on VoIP call integrity if bandwidth saturation occurs.

Triple Play Security Attacks - Analyse the impact of DDoS/virus/worm attacks on delay sensitive IP Video, VoIP and data applications.

Sample diversifEye™ Configuration

Network Under Test
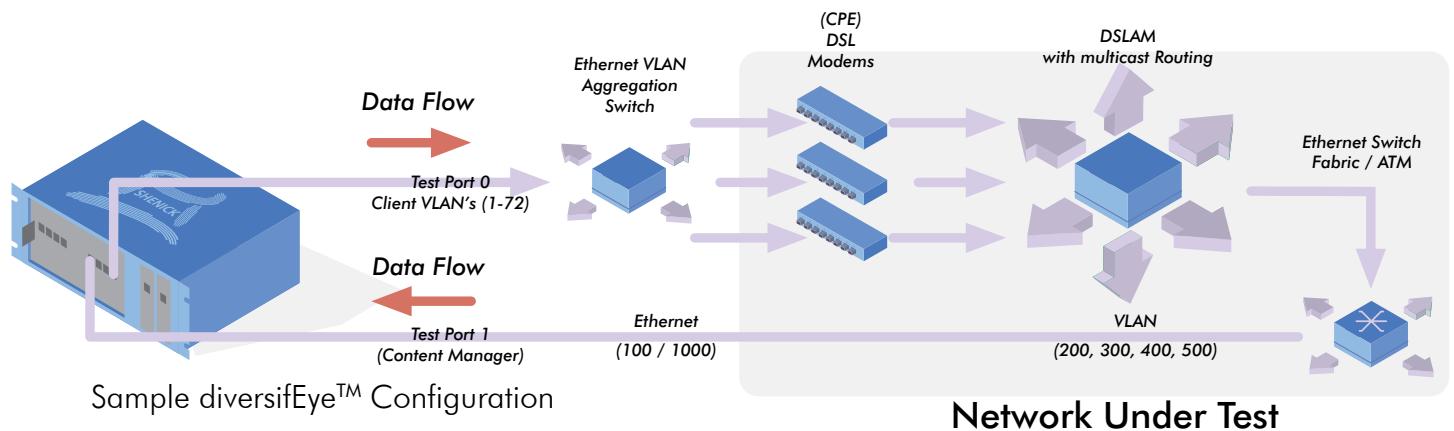
Software Specification

- ■ Per application flow configuration (IPTV, VoIP (SIP/RTP), HTTP, POP3/SMTP, P2P) emulation and analysis.
- ■ Residential gateway emulation through IP-Subsystem mechanism, with per IP flow QoS (diffServ code point (DSCP/ToS) support). Assign multiple application flows per subsystem. Individual MAC and IP address on a per emulated device basis.
- ■ Passive real time TV/Video channel and Active (PEVQ) Video analysis. Emulate video head end server with IGMP channel change capability. Analyse any video format (MPEG2,4 etc.) full suite of ITU J.144 derived quality metrics including perceptual quality, blockiness, chrominance, bluriness etc.
- ■ DHCP Client emulation, IP Subsystems enabled to retrieve remote IP addresses, fully automated. Allocated addresses displayed at GUI level.
- ■ PPPoE network protocols. PAP & CHAP authentication. Support for IPCP. Analysis metrics include setup and teardown times.
- ■ IGMP V1.0, 2.0, 3.0 and MLDv2 supported. Multicast Head End Server and Client emulation QoS assurance with 'per virtual IPTV viewer profile' for assessment of individual client join, leave, average, max, min duration and performance analysis to millisecond resolution.
- ■ VOIP support includes SIP/RTP support (UAC/UAS) Configurable CODECs (G.711, G.729, G.723a, etc). Support for external SIP server or integrated emulated server.

- ■ Full RFC compliant TCP stack with configurable TCP stack parameters.
- ■ HTTP v0.9/1.0/1.1 Client and/or Client + Web Server emulation on a per HTTP application flow basis and/or operating in bulk 'aggregate' load testing mode. Single or multiple HTTP client configuration.
- ■ Peer to Peer (P2P) Application Emulation with support for fully meshed configurations and file sharing between peers. Support for real P2P signatures and also generation of all P2P protocols such as BitTorrent, Kazaa, eDonkey, Skype etc.
- ■ Full SMTP Server and/or Client only emulation (including RFC2920 pipelining), POP3 client and server emulation, manual message edit and generate, auto generate messages and full support for email attachments of all types. Support for VIRUS/WORM generation. Both safe mode (disabled virus) and live mode using real viruses supported. Full support for SPAM generation.
- ■ Full DDoS attack emulation, SYN/RST/UDP/ARP floods, Reflective DDoS attacks, Ping of Death, Teardrop etc. Generate both attack traffic and regular application flows concurrently.
- ■ IPv6 Test Full interworking IPv4 and IPv6 (MLDv2 supported).
- ■ Captured PCAP file replay (TCP/UDP).

KEY FEATURES AND BENEFITS

- ■ Network QoS and per flow QoE granularity for individual emulated home users across multiple devices and triple play application types.
- ■ Latest protocols supported allowing test evolution from Standard Definition IPTV to High Definition IPTV, VoD, VoIP (SIP) and Data Applications in a single test package
- ■ Passive and active (PEVQ) video analysis
- ■ Support for IGMP/MLDv2, IGMP proxies in the home, IGMP Security, PVR Support, MPEG Validation, SIP Proxy Testing,
- ■ DHCP emulation, PPPoE and IPoE Service Interoperability Scenarios. Per triple play appliance MAC and IP address assignment
- ■ Highly scalable test platform offering the user the ability to emulate back end server applications and client applications
- ■ Reduced number of ports required for testing, a single port can emulate several hundred triple play application households.
- ■ Client and server support within a single chassis with complete flexibility on port allocation. Full support for multiple daisy chained chassis all controlled from a single GUI.
- ■ Low cost of ownership and ease of use by avoiding multiple test systems and non integrated software applications.