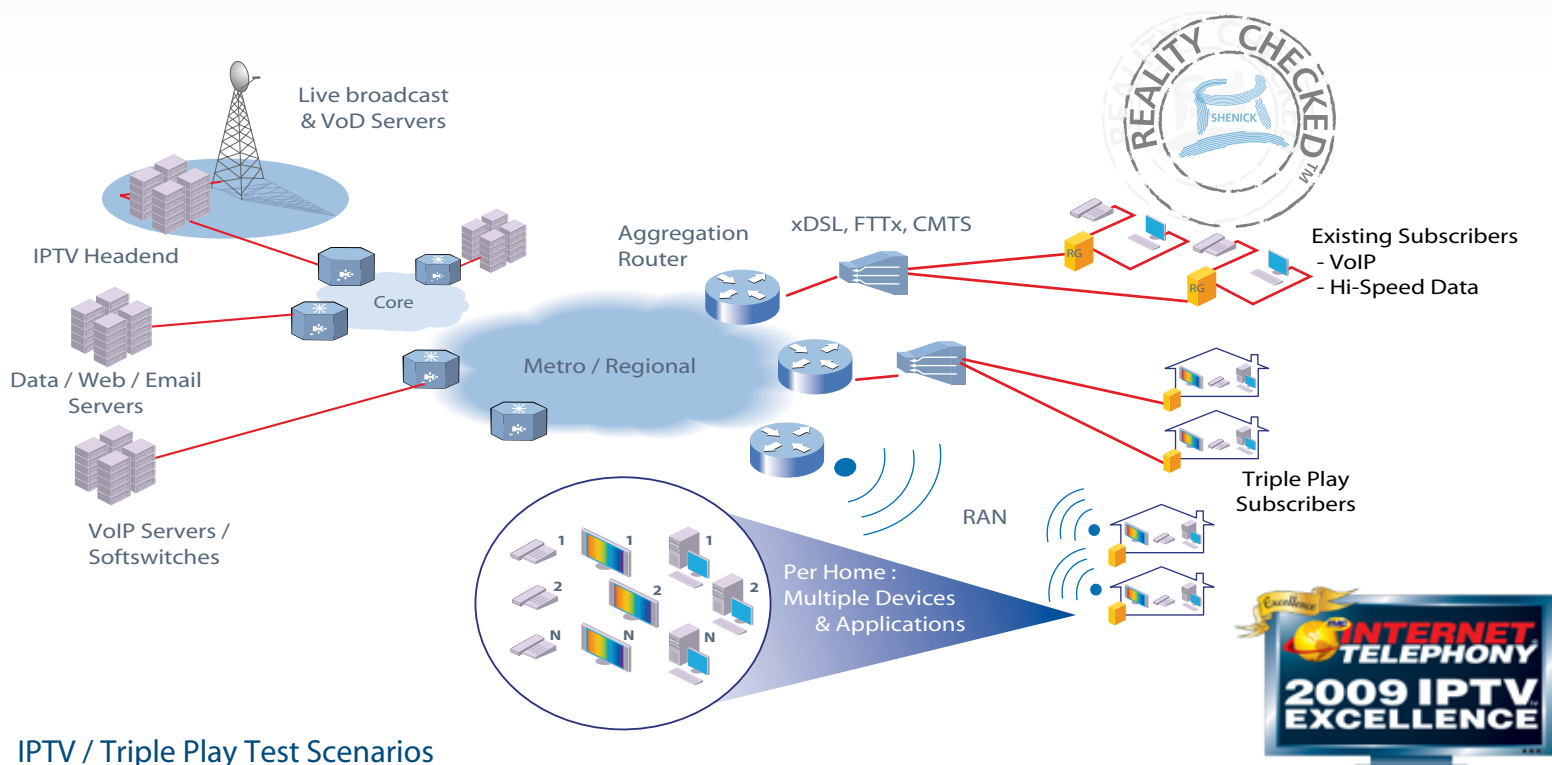




Testing IPTV with diversifEye™

Network infrastructure today is highly evolved and supports a greater number of converged IP applications such as video, voice and data. All of these applications have numerous means of implementation and a myriad of protocols. With a greater emphasis being placed on quality, communications equipment manufacturers and network providers are looking to per flow test solutions to provide measurements for higher quality user experience in applications such as IPTV on infrastructure such as xDSL, CMTS, FTTx, xPON and next generation radio network architectures (LTE).



IPTV / Triple Play Test Scenarios

IPTV 'Per flow' Video Quality -

Analyze IPTV video/audio quality on a per flow, per user basis. Emulate and analyze end-user behavior including channel selection. Video/Audio Quality Analysis includes MOS (Mean Opinion Score) scoring.

IPTV Channel Zap Rate Performance -

Emulate anything from an individual IPTV home user to thousands of users channel change behavior. Determine on a per user basis the length of time a typical user will experience a blank screen, during busy hours or channel change surges.

Mixed Application (IPTV, VoD, VoIP and Data Applications) Performance -

Emulate and analyze IPTV performance with concurrent application sessions including VoD, VoIP and data. Evaluate for performance issues when varying levels of each application flows activity within the network.

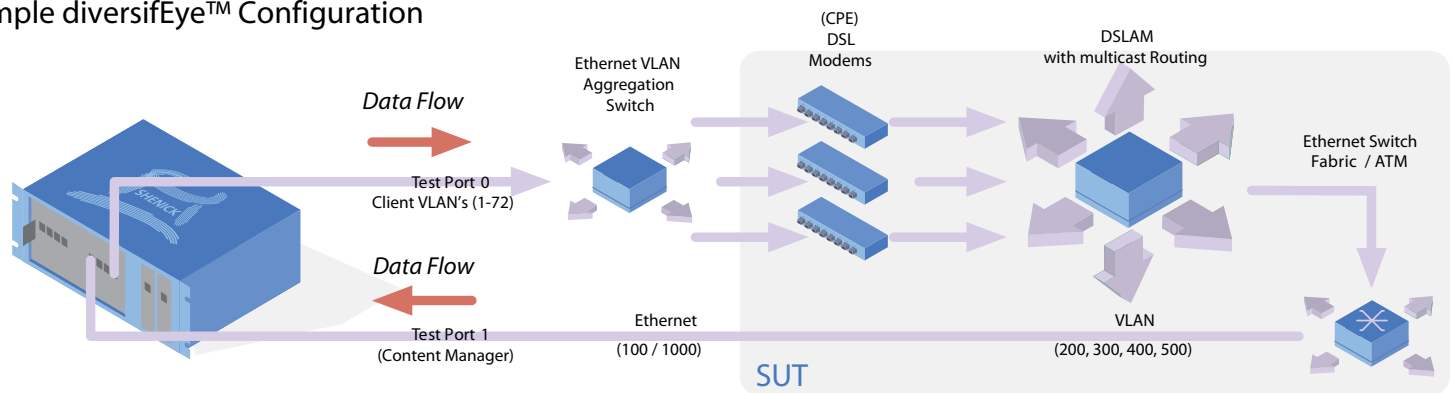
Triple Play Security Attacks -

Analyze the impact of DDoS/virus/worm attacks on delay sensitive Video, VoIP and data applications. Test Security features such as per-subscriber channel change rate-limits, Access Control Lists or per-MAC security.



Next Generation Networks and Applications are constantly pushing network boundaries in terms of Quality of Service (QoS) and Quality of Experience (QoE). Shenick's 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 of IPTV, including the flexibility to measure performance on multiple STBs behind the residential gateway.

Sample diversifEye™ Configuration



Software Specification

- Per application flow configuration (IPTV, VoD, VoIP, FTP, HTTP, POP3/SMTP, P2P, etc) emulation and analysis.
- Residential gateway emulation with per IP flow QoS (diffServ code point(DSCP/ToS) support). Assign multiple application flows per unique host. Individual MAC and IP address on a per emulated host basis.
- Video/Audio quality analysis, analysis for both non-encrypted and encrypted streams.
- Emulate video headend server with IGMP / MLD channel change capability. Support for multiple video codec formats (MPEG2, MPEG4, H.264, etc.)
- DHCPv4, 6 Client emulation - hosts 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.
- IGMPv1, 2, 3 and MLDv1, 2 supported. Multicast Head End Server and/or Client emulation. QoS assurance with 'per virtual IPTV viewer profile', assess individual client join/leave average, max/min with performance analysis to millisecond resolution.
- Telepresence, measure performance on each and every one of the 4 unique media flows per emulated end-point.
- VoIP support includes quality analysis . Dual stack IPv4/IPv6 and Multimedia call functionality. Pre-configured and/or Configurable codecs. Support for external and emulated SIP servers.
- VoD – RTSP (supports fast-forward, rewind and pause functionality), SIP and HTTP enabled VoD sessions supported.
- 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.
- 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.
- Full SMTP Server and/or Client only emulation (including RFC2920 pipelining). 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 (MLDv1,2 supported).
- Captured PCAP (>1Gb) file replay (TCP/UDP).

diversifEye Summary 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 and features supported from IPTV (IGMP/MLD), VoD (RTSP), VoIP (SIP/RTP), Telepresence, Data Applications (HTTP, FTP, POP/SMTP, P2P) all in a single test package.
- Video / Audio Analysis supported.
- DHCP emulation, PPPoE and IPoE Service Interoperability Scenarios. Emulate per device MAC and IP address assignments.
- Security Attack Mitigation support for DDoS style attacks SYN/RST/UDP/ARP floods, reflective DDoS attacks, Ping of death, etc.
- Large memory space (>1Gb) for intelligent PCAP replay for Instant Messaging, Web Mail or Internet Gaming.
- TCP Replay Substitution automatically varies payloads so no two PCAP sessions are the same, ideal for QoS tests.
- Client and server support on a single blade within one 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.

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