RFC 2544 Test Suite

Axtrinet™ APG Ethernet Packet Generators offer affordable 40Gbps & 10Gbps full wire-speed Ethernet load generation, capture and analysis capabilities for R&D, manufacturing, sales and support teams developing and selling products with high speed Ethernet interfaces.

The RFC 2544 Graphical Control Interface and TCL scripted interface are provided as part of the Axtrinet Test Suite.

This application note describes the RFC 2544 implementation on the Axtrinet APG Ethernet Packet Generators.

Features

- Throughput, Latency, Frame Loss Rate, Back-to-Back Rate, System Recovery and System Reset tests defined by RFC 2544.

- RFC2544 Configuration and Control through Test Suite Control Interface Graphical User Interface or Scripted APG TCL API

- Runs over 40Gbps / 10Gbps optical / DA and 10GBase-T copper interfaces.

- Multi-port, uni-directional tests configurations.

- Configurable packet header, including MAC, VLAN, MPLS and ETHERTYPE header fields.

- Configurable report, global parameters and test variables.

- Configurable PDF report format and log file output.
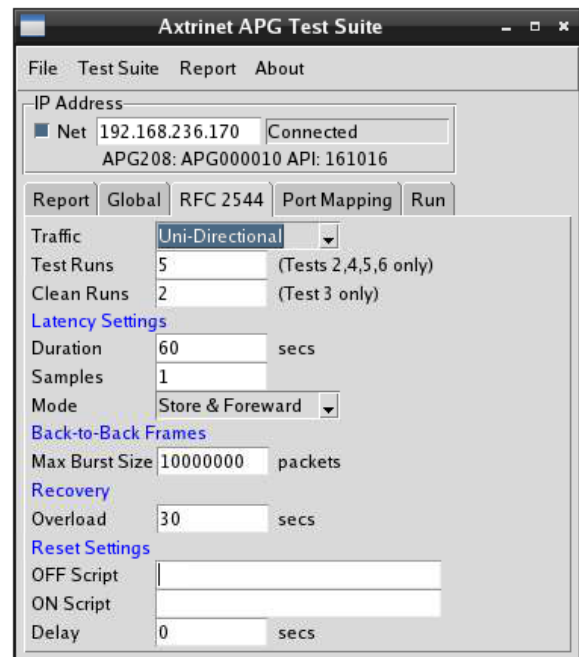
Test Variables

- Frame Size: 64-16000 bytes
- Number of frame sizes: 1-100 sizes
- Number of MAC Addresses: $1-2^{16}$
- Test Duration: 1-3600 seconds
- Clean Runs: 1-1000

- Test Runs: 1-1000
- Recovery Overload: 1-3600 seconds
- Latency Test Duration: 1-3600 seconds
- Latency Samples: 1-1000 samples

RFC 2544 Tests

- **Throughput** – sends a fixed number of packets at a fixed rate through the DUT, and checks that all of the transmitted packets were received. If packets were lost, the rate is reduced and the test repeated until no packet loss occurs.

  The test is repeated for each packet size.

- **Latency** – measures the time taken for the packet to pass through the DUT.

  The Axtrinet Packet Generator adds an optional 'transmit timestamp' to selected packets, and records the time each packet is received to ±8ns resolution.

  The test is repeated for each packet size.

- **Frame Loss Rate** – characterises the DUT performance across the full range of data rates and frame sizes.

  The Axtrinet Packet Generator sends a fixed number of packets, starting at maximum rate, through the DUT and checks that all of the transmitted packets were received. If packets were lost, the rate is reduced by 10% and the test re-run until no packet loss occurs.

  The test is repeated for each packet size.

- **Back-to-Back Frame Rate** – measures the ability of the DUT to process back-to-back frames.

The Axtrinet Packet Generator sends a burst of packets with minimum inter-packet gap into the DUT, and monitors the number of packets received. If packets were lost, the burst length is reduced and the test re-run until no packet loss occurs.

The test is repeated for each packet size.

- **System Recovery Time** – measures the time for the DUT to recover from an overload condition.

  The Axtrinet Packet Generator transmits packets into the DUT at 110%* of the recorded throughput rate for at least 60 seconds (user definable), then dropped to 50%. The recovery time is calculated by extrapolating between consecutive receive rate measurements to determine the time wire-rate transmission resumed.

  * Maximum 100% wire rate

- **System Reset Time** - the speed at which the DUT recovers from a device or software reset.

  The Axtrinet Packet Generator transmits packets into the DUT and monitors the link status and receive rate to determine the unit status. The timer starts when the link drops, and records a) the time the link recovers and b) when it starts receiving packets.

Report Settings

- Short summary test report, or full test report with RFC2544 test descriptions.
- A4 or Letter paper size
- Short or Verbose log output

- DUT descriptors for Model, Serial Number, Revision, Hardware / Software / Firmware versions, Test Ports and Notes

- Test descriptors for Author, Company and Document Classification.

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