Cheetah™ VoIP Test Module

For Alpha DOCSIS®-based Transponders and Tollgrade Model CMD-E

Tollgrade extends the role of existing DOCSIS-based status monitoring equipment with the industry's first HFC-based VoIP test point. The Cheetah VoIP Test Module is a field-downloadable component that enables cable operators to proactively monitor the network's ability to transport VoIP services from the headend to the end-of-line. The VOIP Test Module adds specialized E-MTA functionality to Tollgrade-manufactured DOCSIS-based transponders and end-of-line devices to monitor and test IP-based telephony services.

Any Tollgrade transponder or outdoor-hardened test point that is upgraded with the VoIP test module can be provisioned as an E-MTA and can be configured to answer telephony calls and monitor call quality in real-time, returning RTCP XR Reports (IETF RFC 3661) to the calling system.

Features

The Cheetah VoIP Test Module:

- *Verifies digital phone (VoIP) service availability and reach;*
- *Provides a true gauge of VoIP delivery quality from headend to the end-of-line;*
- *Provides a "standard candle" performance benchmark;*
- *Facilitates remote troubleshooting and testing; and*
- *Provides the ability to identify, separate and test specific network segments.*

Functionality

The Cheetah VoIP Test functions include:

- *Auto-answering of incoming calls;*
- *Measures MOS, R-factor, jitter, packet loss and latency;*
- *NCS Loopback;*
- *Generation of RTCP and RTCP-XR feedback statistics to the originating endpoint;*
- *Returning the NCS DLCX performance parameters to the softswitch; and*
- *Media generation: 1-, 2- and 3-khz tone generation.*

(continued on back)

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Test module available for Alpha DOCSIS-based Transponders and Tollgrade CMD-E End-of-line Test Point.

VoIP Performance Analysis

The VoIP test capabilities include performance analysis based on the following RTCP-XR (Real Time Control Protocol Extended Reports—IETF RFC 3661) call metrics:

- *MOS Listening Quality;*
- *MOS Conversation Quality;*
- *R factor;*
- *External R factor;*
- *Network packet loss;*
- *Packets discarded due to jitter;*
- *Density of lost/discarded packets in burst periods;*
- *RTP round trip delay (mS);*
- *End system delay (mS);*
- *Average jitter buffer delay (mS);*
- *Current max jitter buffer delay (mS);*
- *Max jitter buffer size (mS);*
- *Density of lost/discarded packets in gap periods;*
- *Average duration of gap periods (mS);*
- *Average duration of burst periods (mS);*
- *Signal level (dBm);*
- *Noise level (dBm);*
- *Residual echo return loss (dB);*
- *Gmin—typically 16, which classifies >5% loss as burst; and*
- *Packet Loss Concealment (PLC) and jitter buffer configuration.*

Ordering Information

Please contact your Tollgrade representative for ordering information.

Telephony Specifications

Protocol
GCP/NCS 1.0

CODECS
G.711 μ-law
G.711 A-law
G.728
G.729e

Media Generation
User-defined fixed audio tones

NCS Endpoint
Single Line

Answer Mode
Auto-answer call termination

Test Features
NCS Loopback
RTCP XR call quality metrics (RFC 3611)

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