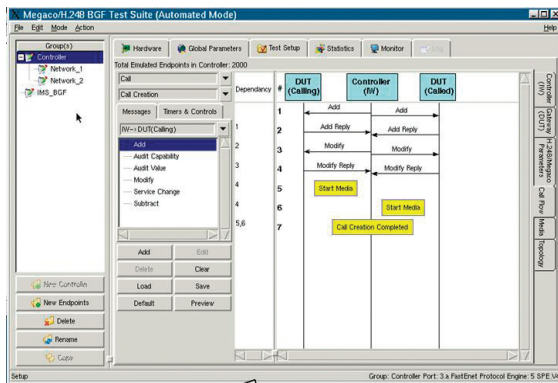
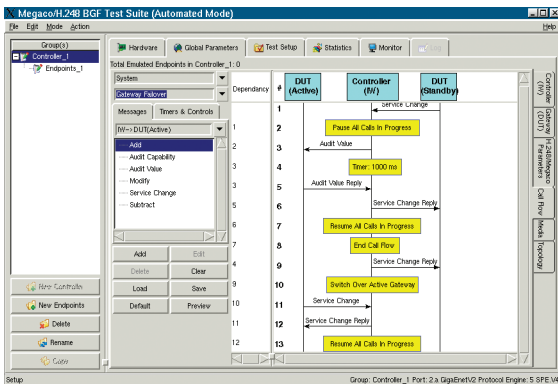


# IMS Border Gateway Test Suite



## Highlights

- Feature, negative, load, regression, interoperability and scalability testing
- Subscribers and controller emulation in a single application
- Flexible and easy-to-use message and call flow editor
- Negative and proprietary messages and call flow definition
- Standard or proprietary packages
- Controller and gateway failover testing
- Large-scale and high-performance solution
- Comprehensive media test capabilities
- Decomposed session border controller and IMS border gateway testing
- Thousands of registrations per second
- Thousands of calls per second (signaling and media)



# Overview

The IMS Border Gateway Test Suite interacts with the SIP subscribers via the media plane and with the controller (SPDF/P-CSCF) with H.248/Megaco protocol based on the TISpan extensions. In a deployed network, the media, SIP and Megaco signaling are synchronized. Simulating and troubleshooting this environment in a lab to test the IMS border gateway before deployment can be a daunting task if multiple independent test boxes/applications are used to emulate the subscribers and the controller.

The IMS Border Gateway Test Suite was purpose-built to test the border gateway. The application integrates the subscribers and the controller into a single flexible but easy-to-use GUI driven test-bed to enable test engineers to easily perform feature, negative, load, regression, interoperability and scalability testing of IMS border gateway functions.

## Key Test Features

### Message and Call Flow Manipulation

- Defines ANY H.248/Megaco message (valid, invalid and proprietary) using a GUI or text-based editor
- Creates any call flow (valid, invalid and proprietary); manipulates protocol state machine using a ladder diagram
- Defines proprietary variables with rules for incrementing and inserting the variables anywhere into any H.248/Megaco message

### Comprehensive Media Test Capabilities

- Negotiates and transmits several codecs simultaneously
- Negotiates one codec but generates another type with higher bandwidth to test the theft of service protection function of the device under test
- Detects in real-time and at line speed whether the device under test is penalizing RTP streams that do not conform to their negotiated codecs/bandwidth
- Verifies path for every established stream to verify whether:
  - Media was detected
  - Media packets were misrouted
  - RTP codec received was not as negotiated
  - ToS/DSCP value for received packets was not as expected
- Measures QoS for delay, loss, inter arrival jitter and MOS with user-defined thresholds
- Provides records for each call that fail the path verification test or exceed the QoS thresholds
- Up to 15 statistics views for 15 combinations of codec, VLAN and ToS values
- User-defined wave files and packetization intervals
- Tests rogue media
- DTMF in SIP info and RFC 2833

### Media Statistics

- Analyzes performance for each individual media/codec type
- Measures packet loss, delay, jitter, R-factor, mean opinion score (MOS) and media delivery index (MDI)
- Validates path of RTP and RTCP packet detecting teardown time, misrouted, unexpected or multiple codec
- RTP DTMF and signaling DTMF sessions active or failed and the reason for failure

## Signaling Statistics

- Summary and detailed signaling statistics per group of endpoints
- Service change and corresponding response messages
- Calls: successful and unsuccessful calls with and without media
- Terminations: active, added, subtracted successful and unsuccessful terminations
- Contexts: active, created and deleted
- Messages: incoming, outgoing and retransmitted
- Errors: incoming, outgoing and error code counts
- TCP connections: active, attempted, successful, unsuccessful and retransmitted

## Automation and Troubleshooting

- TCL command line interface
- Built-in Ethereal monitor for each Ethernet port
- Detailed call records for user defined threshold violations

## Protocol Specifications

### Transport

- TCP, UDP

### Network

- IPv4, IPv6
- DHCP

### H.248/Megaco

- ITU-T H.248.1 v3
- ETSI ES 283 018 v.1.1.1
- ETSI TS 102 333 v.1.1.2

### RTP/RTCP

- RFC 1889, RFC 1890, RFC 2190, RFC 3388, RFC 3551, RFC 3267

### Audio/Video

- ITU-T G.711 (PCMU, PCMA)
- ITU-T G.721
- ITU-T G.723
- ITU-T G.726
- ITU-T G.729
- AMR
- AMR-WB
- EVRC, EVRC-B
- ILBC
- H.264
- H.263

### DTMF

- RFC 2833, H.248 notify

### Voice and Video Quality Analysis

- ITU-T G.107 E-model
- ITU-T P.800.1 mean opinion score (MOS) terminology
- RFC 4445 media delivery index (MDI)

## ORDERING INFORMATION

**N-01C6406** = IMS H.248 border gateway function test application

- **N-01C6132** = RTP codec package
- **N-01C6402** = DTMF generation and analysis
- **N-01C6403** = H.263 and H.264/MPEG-4 video generation and QoS analysis
- **N-01C6404** = AMR generation and QoS analysis
- **N-01C6580** = H.248/Megaco command line interface for automating the IMS H.248 border gateway function test application on the IW
- **N-01C6621** = DHCP support for the IMS Border Gateway Test Suite

Hardware requirements: InterWatch R14 platform or InterWatch M7 platform, a Gigabit Ethernet Interface and a secondary protocol engine version 4.0 (SPEv4).  
Platform software requirements: Contact customer service department.

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