

# GeoProbe® | VoIP

## Network Assurance for Fixed Core and Cable Networks



Comprehensive protocol support ensures the monitoring of critical VoIP operations.

With more and more service providers offering IP telephony service to their subscribers, network operations personnel are tasked with providing established, PSTN-grade quality and reliability in an ever-evolving packet environment. With Tektronix' support of Voice Over Internet Protocol (VoIP) messages, carriers can easily extend their visibility into packet-based call flows for true VoIP performance analysis and improved troubleshooting.

Our Core VoIP Surveillance package supports key access, media gateway controller, inter-softswitch, cable and voice/video transport protocols.

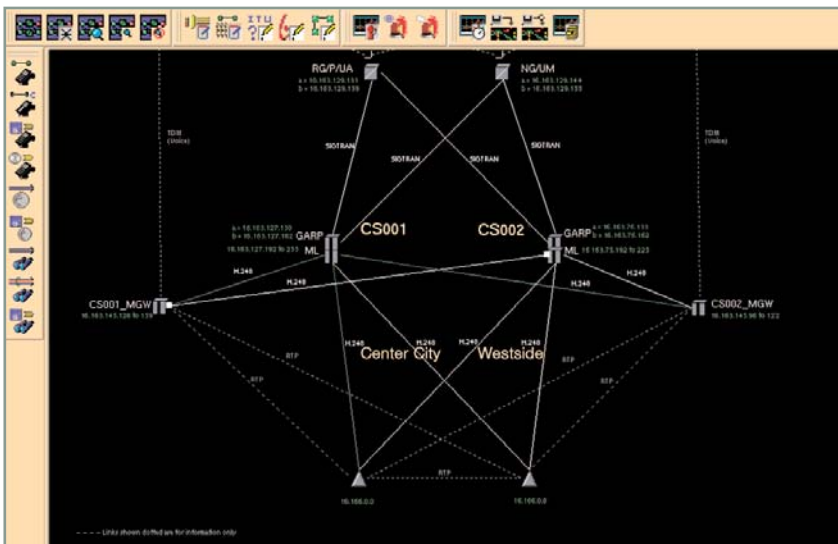
Fully integrated with the GeoProbe system, the VoIP monitoring applications leverage key surveillance capabilities including statistics, real-time and historical multi-protocol call trace and alarms.

VoIP messages are monitored at IP switch mirror ports or IP media taps with Tektronix' GeoProbe system.

Compatible with existing GeoProbe system hardware, VoIP Splprobes gracefully leverage existing network surveillance investments.

Using simple point-and-click procedures, the GeoProbe system allows carriers to create complex network maps.

Additional IP mapping capabilities facilitate address-to-name associations for easy configuration, accelerated alarm investigation and simplified call trace filtering—saving time and reducing errors.



### RADIUS Support

An Internet security protocol, Remote Authentication Dial In User Service (RADIUS) provides centralized authentication, accounting and IP management services for remote access users in a distributed dial-up network. In VoIP environments, a pair of RADIUS servers is used to facilitate these security functions. Tektronix support of standard RFC specifications as well as mobile and vendor-specific attributes offers carriers a complete RADIUS solution for converging IP networks.

### SIP, SIP-T and SIP-I Support

The Session Initiation Protocol (SIP) is a call processing protocol used in VoIP networks around the world to setup, modify and tear down sessions between session participants. With our VoIP offering, SIP is monitored as a call control protocol through the inspection of the SIP message header, Session Description Protocol (SDP) fields and embedded ISUP fields (SIP-T, SIP-I).

### H.323 Support

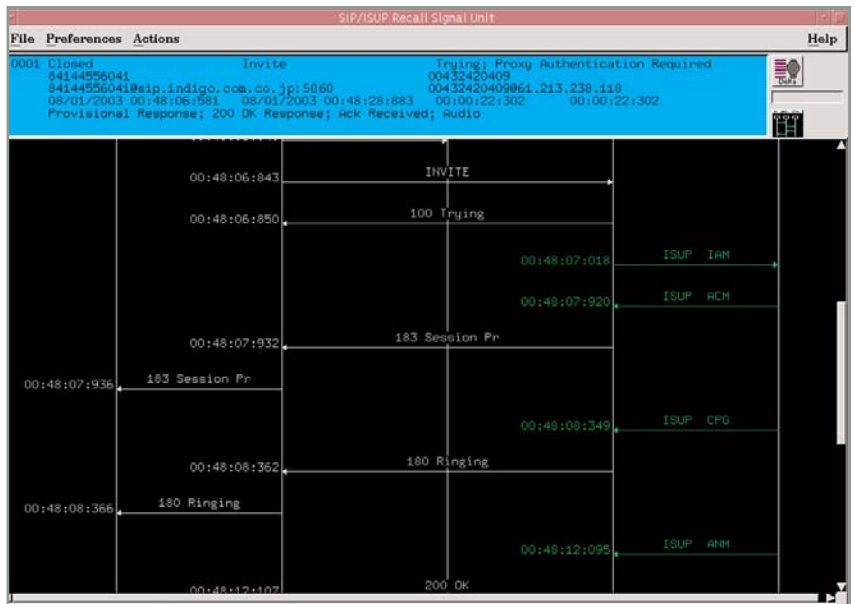
Vital call control, registration, admission and status functions are monitored at the H.323 Gatekeeper and Border Gateway. For H.323 Fast Start networks, Bearer Control monitoring is also supported. Leveraging GeoProbe's multi-protocol correlation capabilities, our H.323 support enables a single view of H.323 / SIP conversions across Session Border Controllers and H.323 / ISUP calls across Gateways.

## Statistics

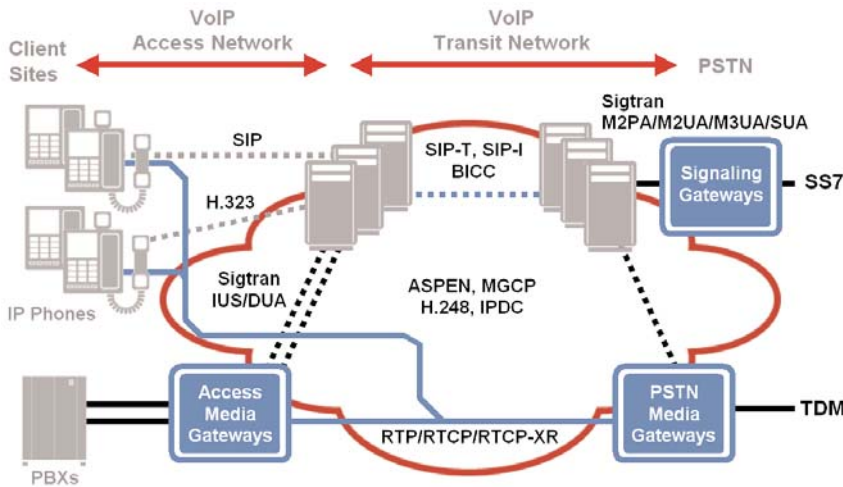
Message- and call-based statistics provide utilization and failure counts as well as more advanced performance criteria per protocol in real time. These same statistics may be used to generate alarms based on user-defined thresholds or to populate On Line Analytical Processing or OLAP-based historical reporting functions for more in-depth and ongoing analysis.

## Multi-Protocol Call Trace

Real-Time and Historical (SUDStore) Call Trace capabilities provide a comprehensive view of individual calls/sessions through the capture and correlation of all associated data. Call traces may be saved to disk or printed for post-capture investigation. Providers monitoring their SS7 traffic with the GeoProbe system will also gain a true picture of IP-PSTN and Voice over Cable off-net interworking through full ISUP correlation capabilities.



The GeoProbe system provides a call sequence trace feature that displays call and transactions in a sequential graphical diagram.



Tektronix' GeoProbe for VoIP monitoring supports the protocols illustrated above.

## Network Assurance for VoIP Networks

The GeoProbe system correlates all call signaling, media gateway control messages and media associated with a single VoIP call across multiple protocols:

- **Call Control Protocols:** SIP, SIP-T / SIP-I, H.323, BICC, SS7 Sigtran M2PA / M2UA / M3UA / SUA
- **Media Gateway Protocols:** H.248/Megaco, MGCP / TGCP / NCS, EGCP, IPDC
- **IMS Support:** SIP 3GPP Extensions, ENUM, DIAMETER
- **Access Gateway Protocols:** ISDN Sigtran IUA / DUA
- **Media Monitoring:** RTP, RTCP, RTCP-XR; RTP Tones & Events Support; H.248 & MGCP EoCQ (End of Call Quality, including XNQ), SIP EoCQ
- **Common IP Protocols:** DNS, DHCP, RADIUS, HTTP, LDAP
- **Multi-Transport Support:** UDP, TCP, SCTP; GigE Copper & Fiber, 10GigE; IP/ATM/STM-1, STM-4
- **PacketCable Support:** NCS, TGCP, DQoS/COPS

**MGCP and H.248 Support**

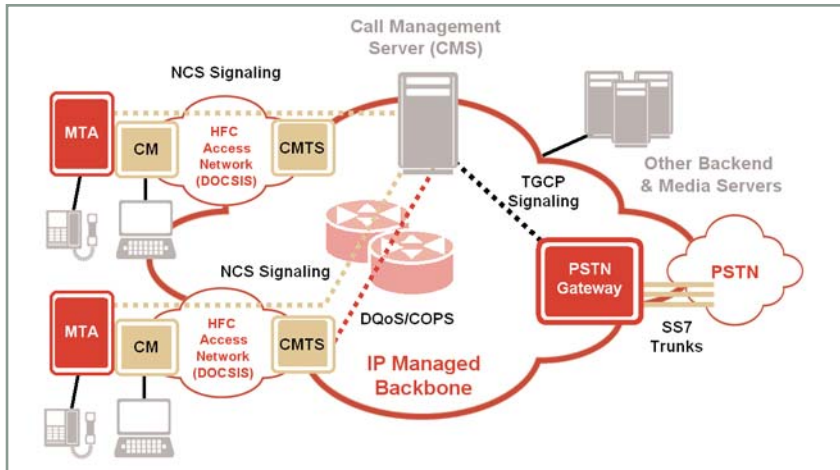
Through support of standard IETF and proprietary Media Gateway Controller Protocols including Lucent's IPDC variants, our VoIP offering is extended to monitor the call control communications between Call Agent / Softswitches and Media Gateways. By monitoring these "transaction-oriented" messages, the setup, modification and tear down of paths from endpoint IDs are closely audited. Call and media QoS information is extracted from the protocol and added in every call trace.

**RTP/RTCP/RTCP-XR Support**

Tektronix' media QoS Monitoring encompasses not only media quality statistics on a per-call basis (such as packet bandwidth, latency, jitter, and packet loss), but also the ability to project Voice Quality Scores on a per-call basis for speech carried using RTP protocols. QoS information is obtained by monitoring RTP, RTCP and RTCP-XR packets. RTP stream capture is also supported.

**Sigtran Support**

Sigtran protocols transport ISDN and SS7 signaling traffic in IP networks, enabling carriers to use their existing ISDN and SS7 network elements on a multi-homed IP transport network. Tektronix monitors BICC, Sigtran IUA, DUA, M2PA, M2UA, M3UA, and SUA call setup and service messages between signaling gateways (SG), media gateway controllers (MGC) and IP-enabled signaling control points (IP-SCP) to provide insight into performance of hybrid TDM/IP networks.



With Tektronix' support of the cable variants illustrated above, MSOs are well-equipped to leverage common technology and deliver cost-effective, quality IP Telephony to Triple-Play subscribers.

## Cable Protocol Support

With customized message version headers, mandated subsets of termination package types and protocol-specific procedures / requirements, Tektronix' MGCP support addresses the Network-based Call Signaling (NCS) and Trunking Gateway Control Protocol (TGCP) variants found in Cable VoIP architectures.

In addition to monitoring the MTA and PSTN MG call control signaling at the CMS or CMTS, the GeoProbe supports Dynamic Quality of Service (DQoS) running over the Common Open Policy Service (COPS) protocol for access control and QoS measurements for organic and third-party voice and video services.

## About Tektronix:

Tektronix Communications provides network operators and equipment manufacturers around the world an unparalleled suite of network diagnostics and management solutions for fixed, mobile, IP and converged multi-service networks.

This comprehensive set of solutions support a range of architectures and applications such as LTE, fixed mobile convergence, IMS, broadband wireless access, WiMAX, VoIP and triple play, including IPTV.

## For Further Information:

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology.

Please visit [www.tektronixcommunications.com](http://www.tektronixcommunications.com)

## Contact Tektronix:

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