

The TelcoBridges Tmonitor TM3000 is a high-performance network monitoring solution for GSM wireless and wireline networks that enables service providers to perform quality of service (QoS) analysis, meet their lawful intercept and E911 or E112 obligations, and enable new value-added offerings, such as real-time location-based services (LBS).

Each Tmonitor TM3000 unit can perform non-intrusive, full-duplex monitoring and filtering of OC3/STM-1 links at line-rate, providing up to 100% packet capture. Data captured by the TM3000 is routed via TCP/IP to an application server where it can be analyzed and acted upon. In addition, PCM voice traffic can be recorded with the onboard IVR capabilities and TB-StreamServer™, a utility application supplied by TelcoBridges.

Adding the TM3000 to your network is like a permanent intelligence upgrade for your network operations. Unlike network probe hardware, the Tmonitor TM3000 does not affect the status of a call or introduce unwanted data artifacts, making it the ideal platform for QoS activities, lawful intercept, and real-time LBS. Unlike a software-based solution, the TM3000 does not negatively impact the overall performance of the network. Finally, the TM3000 is designed to work seamlessly across networks comprised of hardware from multiple telecom equipment manufacturers, capturing all relevant and required data and providing a truly complete picture of the network's operations and the location and status of subscribers, in support of E911, E112 and other real-time LBS efforts.

FEATURES & BENEFITS

Monitoring applications. In addition to recording and analyzing voice traffic, generating and verifying call detail records, the TM3000 allows service providers to perform fraud detection, engage in lawful intercept, support E911 and E112 requirements, and enable location-based billing. The TM3000 also enables service providers to offer new valued-added location-based services, including proximity-based notification, real-time vehicle traffic reports, and the ability to alert roaming customers by SMS.

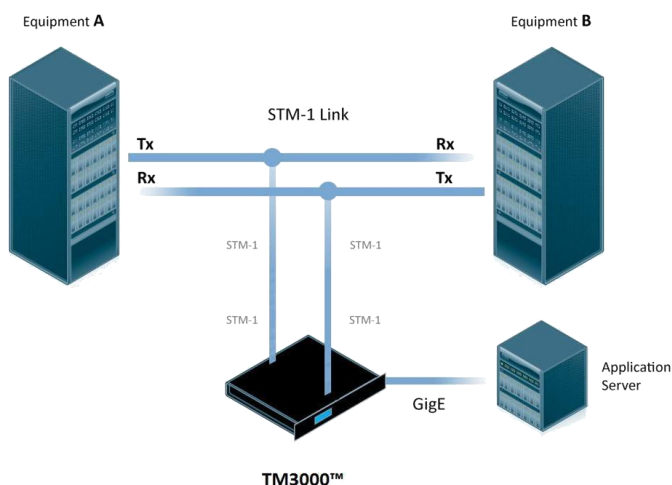
Carrier-grade performance. The Tmonitor TM3000 is TelcoBridges' highest capacity monitoring solution. Multiple TM3000 devices and application servers can be clustered together in one or more facilities to provide essentially unlimited scalability.

Network monitoring flexibility. The Tmonitor TM3000 allows service providers to process and analyze all data captured in SS7, ISDN and HDLC packets and raw OC3 / STM-1 traffic, as well as record up to 2048 simultaneous channels of voice traffic. It features highly configurable on-board packet filters so that only relevant information is captured from traffic streams and stored.

Non-intrusive. In order to maintain overall system performance and QoS, the TM3000 does not introduce latency or otherwise modify or alter the stream of communications. The TM3000 fully supports multi-vendor network architectures and requires no modification to existing communications equipment.

The TelcoBridges Tmonitor TM3000 is the leading carrier-grade solution for service providers looking to monitor, analyze and optimize their network performance while laying the groundwork for new offerings like real-time LBS. For more information, please visit www.telcobridges.com.

> **Figure:** sample integration of the Tmonitor TM3000



TM3000 SPECIFICATIONS

INTERFACES

- > 2 OC3 / STM-1 (half-duplex)
- > 1 OC3 / STM-1 (full-duplex)
- > Dynamically configurable
- > Channelized

Optical Module

Specification: OC3 / STM-1
Wavelength : SMF 1310nm
Module type: SFP LC

Electrical Module

Specification: STM-1E
Coax: DIN 1.0/2.3
Module type: SFP

Filtering

- > Up to 2,048 packet filters based on a byte boundary offset, bit mask, and matching value range

DATA CAPTURE RECORDING

- > Captured packets are detected between 0x7E flags
- > Captured packets are checked for errors as per ITU-T Q.703, Q.721 (16-bit CRC)
- > Packets are individually time-stamped to ensure proper ordering (125 microsecond precision)
- > Captured data is forwarded to the application via TelcoBridges' asynchronous message-based API
- > Voice traffic is recorded with the TB-StreamServer™ application
- > Dual redundant GigE control and data recording paths

MANAGEMENT & CONTROL

- > Live configuration and software upgrades via HTTP
- > Monitoring via HTTP
- > Configuration of multiple TM3000 devices in the same system with a single interface
- > SNMP v2 GET of individual TM3000 appliance

MANAGEMENT AND IP INTERFACES

1 RJ45F serial console port with RS-232C adapter
1 10/100/1000base-T management interface
4 10/100/1000base-T IP interface

MECHANICAL

- > 1U with single power supply, 2U with redundant power
- > 19 inch or ETSI 600 mm rack mount options
- > 1U: 1.75" H (44,5 mm) x 17.4" W (442 mm) x 17" D (430 mm)
- > 2U: 3.5" H (89 mm) x 17.4" W (442 mm) x 17" D (430 mm)
- > Weight: 1U module 20 lbs (9.1 Kg); 2U module 25 lbs (11.4 Kg)

REGULATORY COMPLIANCE

- > Designed to meet NEBS Level 3

EMC

- > FCC Part 15 (2004), sub-part b
- > EN55022(1998)
- > EN61000
- > ENV50204(1995)

CAPABILITIES

Protocol Compatibility

- > SS7
- > MTP1/MTP2-based wireless interfaces (e.g., A, Abis, D)
- > Frame relay-based wireless interfaces (e.g., Gb)
- > ISDN PRI
- > V5.1, V5.2
- > Any HDLC-like protocol (PPP, X.25)

Monitoring Capabilities

- > 4 HDLC mezzanine slots
- > 512 HDLC controllers per mezzanine (16, 32, 56, 64, n x 64 kbps where n = 1 to 31, SS7 HSL)
- > Expandable to 2048 HDLC controllers via optional mezzanine modules
- > Controller modes
 - > Raw (captures complete bit stream)
 - > HDLC (captures all HDLC frames)
 - > SS7 (captures SS7 frames, FISU and LSSU filtered out)
 - > PCM voice (captures PCM voice samples)
- > Processing capability: 200,000 HDLC frames per second
- > Total maximum aggregate bandwidth capacity of 2 x 80 Mbps (Rx and Tx monitoring)

Voice Recording Capabilities

- > 1 IVR mezzanine slot
- > Provides up to 2048 simultaneous recording channels
- > DSP-based plug-in module with options of 128 to 512, 1024, 1536 and 2048 channels
- > Voice recording performed via TB-StreamServer utility application
- > DTMF detection

SYSTEM SCALABILITY

- > Unlimited number of TM3000 units per system
- > Unlimited number of target data recording servers
- > Redundant application server control (active-active or active-standby)
- > Live TM3000 additions and removals

APPLICATION DEVELOPMENT ENVIRONMENT

- > Easy to integrate asynchronous message-based API
- > OS support: Intel/SPARC Solaris™, Linux, Windows®
- > Sample application source code for most functions

ELECTRICAL

- > -48 VDC or 120/240 VAC, 50/60 Hz power options
- > 65 to 128 Watts fully loaded

COMPLIANCE AND SAFETY

- > Designed to meet NEBS Level 3
- > CE
- > IEC60950-1:2005; UL60950-1, 2nd edition 2007
- > CSA C22.2 No.60950-1-07 first edition March 2007

ENVIRONMENTAL

- > Operating: 0 to +50° C, 95% non-condensing relative humidity
- > Storage: -20 to +75° C, 95% non-condensing relative humidity