The TelcoBridges Tmonitor TM1000 is a high-performance voice and data traffic monitoring solution that enables service providers to record and analyze messages, as well as optimize network performance and quality of service (QoS), while providing a foundation for new value-added offerings, such as location-based services (LBS).

Each Tmonitor TM1000 unit can perform non-intrusive, full-duplex monitoring and filtering of 64 T1/E1/JI interfaces per device, providing up to 100% packet capture. Data captured by the TM1000 is then routed by TCP/IP to an application server where it can be analyzed and acted upon. In addition, PCM voice traffic can be recorded with TB StreamServer™, a utility application supplied by TelcoBridges.

Unlike a network-monitoring probe, the Tmonitor TM1000 does not affect the performance of the network or the status of a call, or introduce unwanted data artefacts. For cases where it is located immediately next to the network to be monitored, the TM1000 is designed to work with a purpose-built 32-port Monitoring Patch Panel that features a high-impedance circuit to limit signal drain. For longer distances, **TelcoB**ridges has designed an optional 16-port isolation patch panel, used in conjunction with the monitoring patch panel, which helps to maintain high-impedance resistance in the path to the monitoring equipment.

FEATURES & BENEFITS

Monitoring applications. In addition to recording and analyzing voice messages, generating and verifying call detail records (CDR), the TM1000 allows service providers to perform fraud detection, lawful interception, and location-based billing. The TM1000 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.
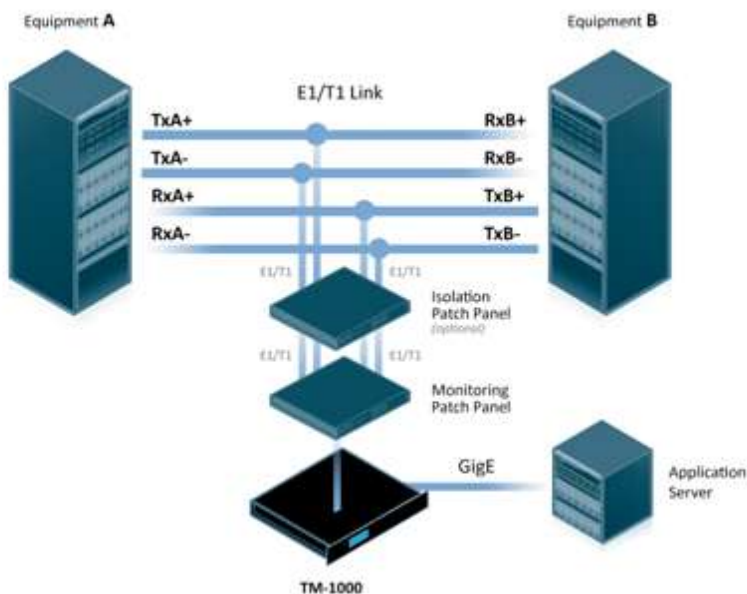
> **Figure**: sample integration of the TM1000

Carrier-grade performance. The Tmonitor TM1000 is a high volume monitoring solution. Multiple TM1000 devices and application servers can be clustered together in one or more facilities to provide essentially unlimited scalability. Application servers can also be deployed remotely for fully distributed monitoring.

Network monitoring flexibility. The Tmonitor TM1000 allows service providers to process and analyze all data captured in SS7, ISDN and HDLC packets and raw T1/E1/J1 traffic, as well as record specified 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 Quality of Service (QoS), the TM1000 does not introduce latency or otherwise modify or alter the stream of communications. Installation of the TM1000 requires no modification to existing communications equipment.

The TelcoBridges Tmonitor TM1000 is the leading carrier-grade solution for service providers looking to monitor, analyse and optimize their network performance while laying the groundwork for new offerings like location-based services. For more information, visit www.telcobridges.com.

TM1000 SPECIFICATIONS

INTERFACES

Monitoring Interfaces
> Up to 128 E1/T1/J1 interfaces (software selectable, half-duplex), or
> Up to 64 T1/E1/J1 interfaces (software selectable, full-duplex)
> Software upgradeable from 32 to 64, 96 or 128 E1/T1/J1 receivers
> High-impedance isolation using monitoring patch panel (see below)

E1 (dynamically software selectable)
> HDB3 or AMI line coding
> 2 or 16 frames per multi-frame with or without CRC-4
> High-impedance isolation according to ITU-T G.772 using monitoring patch panel

T1/J1 (dynamically software selectable)
> B8ZS or AMI line coding
> SF or ESF frame formats
> High-impedance isolation according to ANSI T1.102-1993 using monitoring patch panel

MANAGEMENT INTERFACES
1 RJ45F serial console port with RS-232C adapter
2 100/1000base-T management interface

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

MECHANICAL
> Compact 1U form factor
> 19 inch or ETSI 600 mm rack mount options
> 1.75" H (44,5 mm) x 17.4" W (442 mm) x 11" D (279 mm)
> Weight 10 lbs (4.53 kg)
> 4 SCSI-3 female output connectors for interfacing with 2 Monitoring Patch Panels

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

Monitoring Patch Panel details (optional)
> 32 RJ45 female E1/T1/J1 input connectors
> 2 SCSI-3 female output connectors
> Individually configurable high-impedance circuits for each link
> 19 inch or ETSI 600 mm rack mount options
> Maximum insertion loss of 0.7 dB

CAPABILITIES

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

Monitoring Capabilities
> Up to 512 HDLC controllers (16, 32, 56, 64, n x 64 kbps where n = 1 to 31, SS7 HSL)
> Controller modes
>   > Raw (captures complete bit stream)
>   > HDLC (captures all HDLC frames)
>   > SS7 (captures SS7 frames, FISU and LSSU filtered out)
>   > Voice (captures G.711 voice samples)
> Processing capability: more than 175,000 HDLC frames per second
> Total maximum aggregate bandwidth capacity of 2 x 80 Mbps (Rx and Tx monitoring)

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

SYSTEM SCALABILITY
> Unlimited number of TM1000 units per system
> Unlimited number of target data recording servers
> Redundant application server control (active-active or active-standby)
> Live TM1000 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
> Less than 60 Watts nominal

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

SAFETY
> CE
> IEC60950-1:2005; UL60950-1, 2nd edition 2007
> CSA C22.2 No.60950-1-07 first edition March 2007

COMPLIANCE
> Designed to meet NEBS Level 3

Isolation Patch Panel details (optional)
> 32 RJ45 female E1/T1/J1 input connectors
> 16 input ports + 16 output ports
> 19" or ETSI 600 mm rack mount options
> Maximum insertion loss of 0.7 dB