*T*monitor™
TM3000

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

Adding the TM3000 to your network is like a permanent intelligence upgrade for your network operations. Unlike network probe hardware, the *T*monitor 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.

Each *T*monitor 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.

Features and Benefits:

Monitoring applications. In addition to recording and analyzing voice traffic, and 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 *T*monitor 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 *T*monitor TM3000 allows service providers to process and analyze all data captured in SS7, ISDN and HDLC packets and raw OC3 / STM-1 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.

Product Characteristics

2 OC3 / STM-1 (full-duplex)
4 OC3 / STM-1 (half-duplex)
Dynamically configurable
Channelized
Filtering of up to 2,048 packet filters based on a byte boundary offset, bit mask, and matching value range

Hardware Interfaces

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

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
Dual redundant GigE control paths

Management and Control

Live configuration and software upgrades via network
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
2 100/1000base-T IP interfaces for control plane

Protocol and 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

1024 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)
Processing capability: 200,000 HDLC frames per second
Total maximum aggregate bandwidth capacity of 2 x 80 Mbps (Rx and Tx monitoring)

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 Linux, Windows®
Sample application source code for most functions

Electrical Characteristics (Power Input)

-48 VDC or 120/240 VAC, 50/60 Hz power options
90 Watts fully loaded

Physical Characteristics (Dimension & Weight)

1U with redundant power supply
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)
Weight: 1U module 20 lbs (9.1 Kg)

Regulatory Compliance and Safety

EMC

FCC Part 15 (2004), sub-part b
EN55022(1998)
EN61000
ENV50204(1995)
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 +50º C, 95% non-condensing, relative humidity
Storage: -20 to +75º C, 95% non-condensing, relative humidity