Symmetricom

TimeWatch

Sync Network Quality System

KEY FEATURES

- Complete Sync Network Characterization
- Sync Quality Assurance
- Continuous Monitoring
- Alarm Forwarding
- Performance Analysis

INTRODUCTION

Symmetricom's TimeWatch™ is a network synchronization quality monitoring system. The system allows telecommunication network operators to cost-effectively monitor the synchronization characterization of any link 24 hours a day, 365 days a year. A monitored sync network provides the visibility and control to lower operational costs while efficiently delivering services. TimeWatch offers the ability to precisely locate and quickly respond to alarms, which minimizes network downtime.

ARCHITECTURE

TimeWatch architecture consists of two main elements, the probes and the server. The probes are located at the measurement points and perform a synchronization characterization of a link against a reference, which then is transmitted to the server. The server performs a network sync quality monitoring function including performance analysis and alarm forwarding.

TIMEWATCH PROBE

The probes measure the synchronization performance parameters of a signal in terms of phase and MTIE against a reference. There are three types of probes based on the availability of the reference signal: Reference, Standard and Lite.

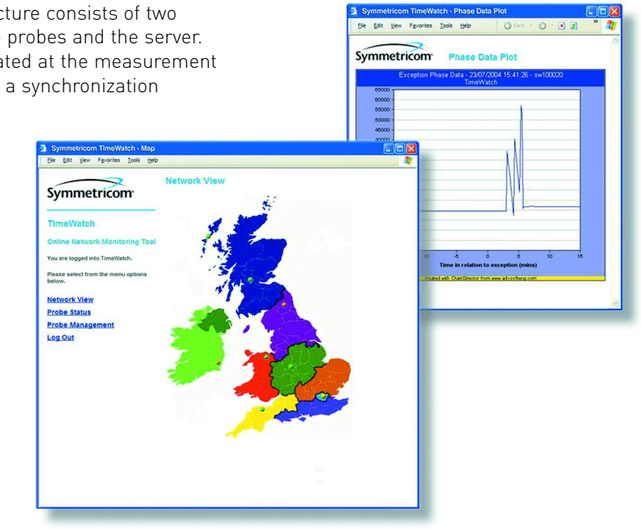

FIG. 1 TimeWatch Software

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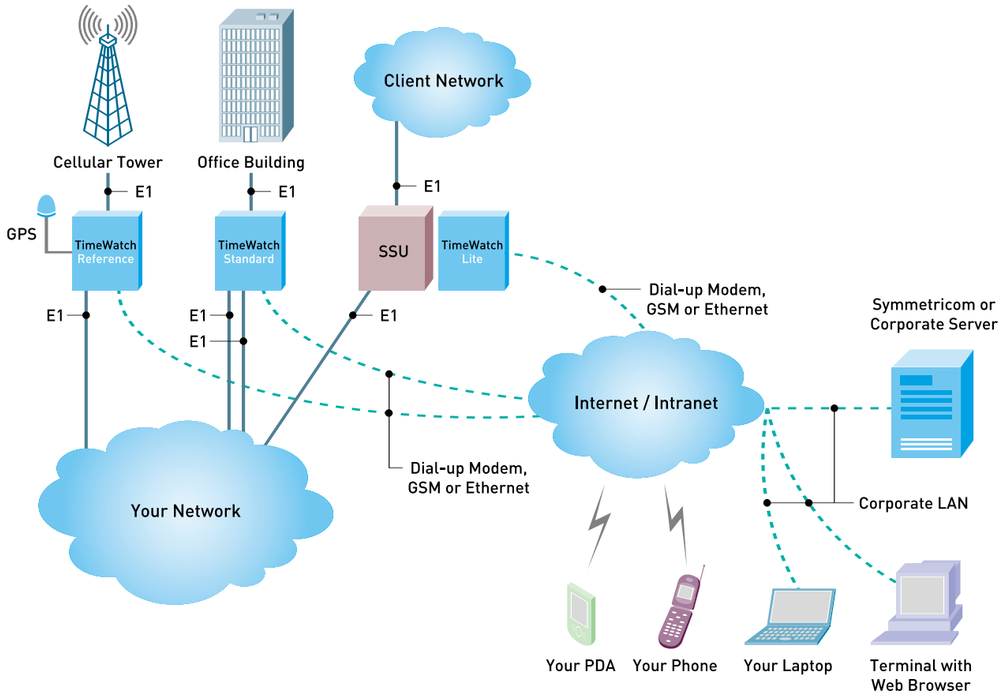

FIG. 2 TimeWatch system deployed across the network

TIMEWATCH REFERENCE PROBE

The reference probe uses a built-in GPS receiver to allow the measurement of "Measure In" against a GPS disciplined oscillator. This allows MTIE to be computed if only a single measurable input is available. The probe provides the data retrieval and interfaces with the server generating alarms in case of a degradation of network synchronization performance. The GPS disciplined reference signal is also passed through to the "Aux Out" for use by other equipment.

TIMEWATCH STANDARD PROBE

The standard probe uses a built in phase measurement engine to measure a relative MTIE between two inputs: "Measure In" and "Ref In". The probe provides the MTIE computation and interfaces with the server generating alarms in case of a degradation of network synchronization performance. If "Ref In" is a 2.048 MHz signal, it can be passed through to an auxiliary output for use by other equipment.

TIMEWATCH LITE PROBE

This probe uses an existing synchronization system, either a primary reference source (PRS) or a supply unit (SSU) to provide the phase measurement and allows a cost-effective implementation on sites where sync systems are already deployed. The sync system will perform the phase measurement and compute MTIE while the probe retrieves data and interfaces with the server generating alarms in case of a degradation of network synchronization performance.

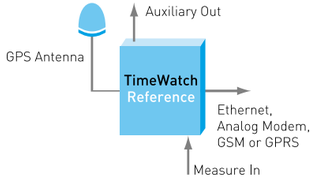

FIG. 3 TimeWatch Reference Probe

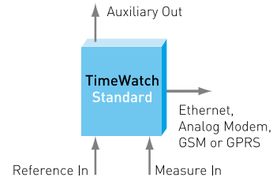

FIG. 4 TimeWatch Standard Probe

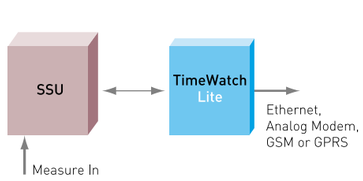

FIG. 5 TimeWatch Lite Probe

TIMEWATCH SERVER

The server receives the heartbeat and alarm data from all the probes. The server runs on a standard PC and is accessed via a web browser. The TimeWatch Server holds a performance database for all deployed probes and provides MTIE and phase (TIE) data on probes which exceed their programmed masks. A configurable map based graphical interface is available for navigating around the deployed probes.

The server can either be owned by the network operator or hosted by Symmetricom. The network and individual probes can be configured via the server. There are three levels of security with different passwords for each level:

- **User:** Monitors alarms and network performance. Can acknowledge and clear alarms.
- **Manager:** Manages and configure the probes, sets the interface types, as well as the masks used for alarm generation and the comparison masks for display purposes.
- **Architect:** Configures the network monitoring, adds and/or deletes new probes. Names and locates probes and sets up the map structure.

FIG. 6 TimeWatch Probe

TimeWatch Specifications

• Communication interfaces:	Ethernet, dial up modem, GSM/GPRS modem
• Power supply:	-48 Volts
• Size (H x W x D):	45 mm x 355 mm x 130 mm
• Connectors	
Reference In:	BNC 75Ω unbalanced
Measurement In:	BNC 75Ω unbalanced
Power:	4 Pin terminal block
Alarm contact closure:	3 Pin terminal block
Analog modem:	RJ11
GPRS antenna:	SMA
GSM antenna:	SMA
SSU port:	RS232, 9 Way D-Type
• Management port:	9 Way D-Type
• TimeWatch Lite:	Clock measured by TimeSource 3100/3600 against internal clock
• Supported SSU:	TimeSource 3100, TimeSource 3600
• TimeWatch Standard:	Clock measured against each other and MRTIE generated
Measure In:	2.048 Mbit/s G.703 Section 9 (for non-traffic interface) Tapped 2.048 Mbit/s G.703 Section 9, -30dB (for traffic interface via a splitter) 2.048 MHz G.703 Section 13
Reference In:	2.048 Mbit/s G.703 Section 9 (for non-traffic sync interface) Tapped 2.048 Mbit/s G.703 Section 9, -30dB (for traffic interface via splitter) 2.048 MHz G.703 Section 13
Aux output:	2.048 MHz G.703 Section 13 (copy of Reference Input, option)
• TimeWatch Reference:	Network clock measured against GPS disciplined clock and MTIE generated
Measure In:	2.048 Mbit/s G.703 Section 9 (for non-traffic interface) Tapped 2.048 Mbit/s G.703 Section 9, -30dB (for traffic interface via a splitter) 2.048 MHz G.703 Section 13
Aux output:	2.048 MHz G.703 Section 13 generated from GPS disciplined oscillator
• TimeWatch Server Requirements:	Pentium equal to or greater than 800 MHz 1 Gigabyte free hard disk space Windows 2000 workstation or server