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The Solo Family Advantage

Wherever there are networks...



Setting the Standard

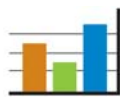
TSB, an ISO registered Company, has set the standard since 1984 for remote access data collection, alarm monitoring and maintenance interface solutions. Today, more than 60,000 TSB remote units are used around the world. Working around the clock with TSB's Solaris-based Site Events Manager (SEM), Security Access Manager (SAM) and Remote Performance Metrics (RPM) applications, Solo Remote Element Monitors (REM's) help telecom service providers to manage **costs, service, performance, change** and **security**.



Costs



Service



Performance



Change



Security

Solo REM's provide a common interface to remote multi-vendor equipment for a wide variety of tasks. Distributed intelligence is the key to the effectiveness and flexibility of the Solo-SEM remote access platform. User-configurable OEM-specific logic modules and alarm classification patterns, downloaded from SEM and stored securely in FLASH memory, are the basis of consistent, proactive network management and enable time-and-money saving Solo features.

The same logic that enables Solo to identify alarm records is used for recognition of managed element-specific traffic records and collection. Traffic information is useful in determining whether networks are fine-tuned, which features are being utilized, which consoles are efficiently staffed and whether the network trunking facilities and routes are overloaded or under-utilized. As this information is not necessarily in a form that is easily deciphered, Solo can be used transform this unfocused traffic information into valuable traffic studies.

Solo units can also operate as intelligent CDR call logging units, alarm and service level monitors, secure maintenance access portals to LAN/WAN elements and desktops, SNMP trap translators, and environmental/security event managers. All of these tasks can be configured to run simultaneously.

Solo REM's use VxWorks, a reliable embedded real-time operating system that has a proven track record with organizations such as NASA and Nortel Networks. Equipped with powerful CPU's, Solo can process alarms, translate SNMP traps, monitor contact events, handle CDR and traffic, transmit data, and manage/log user access—all at once. Solo can manage any combination of data collection over both the Ethernet and serial connections. Up to five users can login and work with a Multiport at the same time. Solo REM's use a real time clock equipped with Time Zone including DST.

Solo units protect user/customer data and configuration settings by providing up to 8 GB of non-volatile data storage. Solo Multiport offers an optional 1 Terabyte internal hard drive with room to store software applications or patches for automatic, scheduled deployment.

Security

As service providers take on the expanding role of managing service levels and elements inside customers' networks, the question of network security becomes of paramount importance. The Solo-SEM platform enables the most comprehensive set of remote access security features on the market to protect customer equipment and data; and allows service providers to demonstrate that network security is effective.

Access is limited by strong password with configurable aging protection. Solo can provide configurable user audit levels for each user. By logging into Solo by Dial-up, PPP, ADSL or LAN, an authorized user is given access to a device connected to a specified Solo serial or network port. Restricted access to the Solo shell ensures remote users are unable to alter Solo security parameters.

Users can configure all of the following security features:

IPSEC /IKE — Solo IPsec and IKE implementation is based on a VPNC-certified solution. Solo provides for authentication, data integrity, and encryption of any network traffic on the IP layer. IPsec supports the standard Authentication Header (AH) and Encapsulation Security Payload (ESP) functions, as defined by the IETF.

Solo IPsec and IKE utilize a broad suite of encryption and hashing algorithms, providing compatibility with customers' other VPN equipment.

<u>Authentication Mode</u>	<u>Authentication Algorithms</u>	<u>Encryption Algorithms</u>
Pre-Share Key (PSK)	MD5	DES-56
Digital Certificate	SHA	3DES-168
		AES-128
		AES-192
		AES-256

VPN — Solo can create multiple VPN connections with multiple VPN gateways. Using PPPoE Client, Solo can connect to the internet through an external ADSL modem. Solo supports both VPN termination point and VPN pass-through external ADSL modem/router devices.

Network Address Translation — Solo units simplify how service providers manage LAN/WAN-based elements using PPP, Ethernet or ADSL sessions—without compromising security or disrupting customers' IP addressing schemes. Using NAT protocols, Solo holds multiple tables of network elements by IP address and automatically maps them to a block of user-defined universal IP addresses that service providers can apply across an installed base. Solo units can keep track of up to 256 discrete elements on a given network.

IP Address Filtering — Solo provides IP Address filtering which limits remote user access to only the network elements that have IP addresses defined in Solo. The addition of dynamic entries allows control over the network traffic, through and to, Solo in real-time. As soon as a rule is added, it takes effect immediately.

Revertive Callback — uses matching password and phone number pairs. When a request for Transparency is made Solo matches the user login password with a unique originating phone number, disconnects the user, and then returns the call at the approved number. On network connections, Solo matches the originating IP address for enabling Transparency.

Caller ID — originating phone numbers, presented to Solo at login, can be used to block all calls from unauthorized numbers.

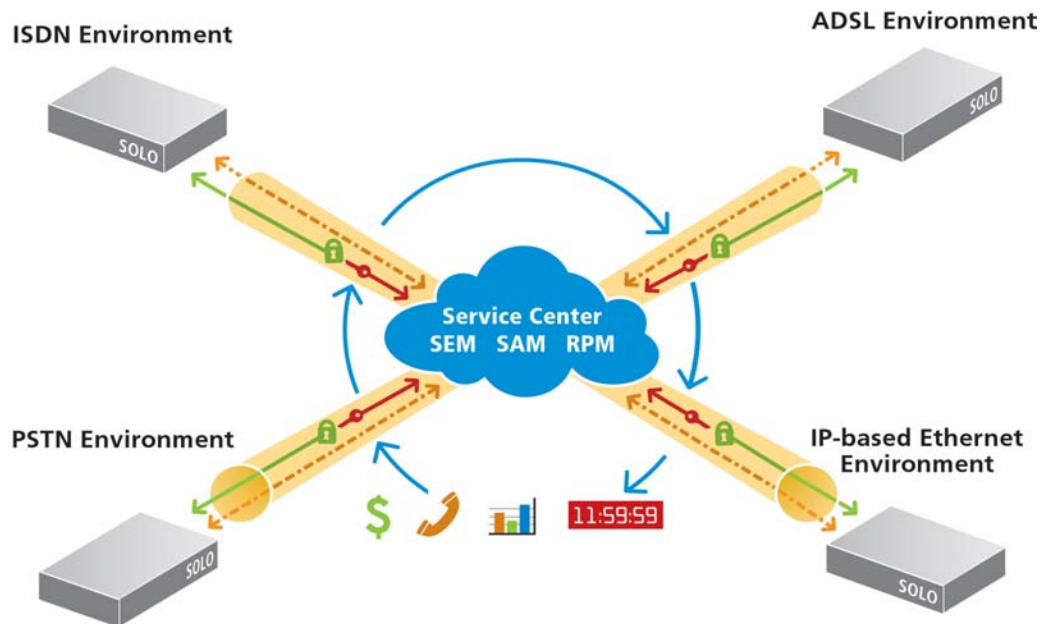
Multi-level Passwords — can be configured to limit user access by equipment type and/or by Solo command line functionality.

Random Password Change — implementation automatically ensures that passwords in Solo are being randomly generated and regularly aged and retired by the SEM.

Built-in Firewall — provides IP Address filtering that limits remote user access to only the network elements with IP addresses defined in Solo

Restriction by Solo Port — can be restricted by either Serial or Virtual Port Number, enabling specified 3rd Party contractors to perform upgrades and maintenance via an allocated port without compromising the entire Solo network installation.

Failsafe Transition LAN/WAN to PSTN — When LAN's fail, Solo automatically reverts to reliable PSTN communications to dial out alarms in real time and provide a transparent diagnostics interface for service technicians.



Network Management

Remote Desktop/Discrete Network Gateway — Solo is sophisticated enough to enable users to access remote desktops without compromising local or network security. This gives service providers the capability to manage and reconfigure server-based CTI applications such as Nortel Networks Symposium. The second Ethernet port available in Solo Multiport and Solo Trio, enables service providers to gain secure in-band access to elements on Equipment LAN's or alternatively use PPP and/or ADSL for remote access requiring greater bandwidth.

Scheduled Health Checks of Network Elements — Solo units make it easy for service providers to benefit from preventative maintenance. On a user-scheduled basis, up to 256 elements on a LAN can be 'pinged' by a Solo unit to confirm their status and/or availability. The Solo-SEM platform provides users with great flexibility in defining how these network health checks are reported. E.g. confirm the outcome of every health check; report only those that fail; compare health checks and only report discrepancies.

SNMP Trap Conversion — Solo lets service providers extend service offerings by handling SNMP traps from one or more network elements. SNMP messages are translated and reported by Solo as user-defined, text-based alarms dispatched to SEM and/or 3rd Party network management centers such as HP OpenView or Remedy.

FTP Server — Solo provides up to 1 Terabyte (TB) of non-volatile storage for backup of configuration data or other element-specific information: e.g. voice mail records. This information can optionally be compressed and/or encrypted by Solo in real-time.

Multiple Remote Connectivity — Solo is capable of communicating using Ethernet, PPP, Dial Up or ADSL to remotely access any other network equipment residing on the same network.

Transparency Interface With The Managed Element — Transparency is an interactive function that lets you dialog with the managed element remotely and clear up minor problems within minutes instead of hours. Solo eliminates the need for any other remote access devices to be attached to the local managed elements.

Event Management

Consistent Alarm Handling — Downloaded logic modules enable Solo REM's to master the distinctions between the outputs of various types/vintages of OEM elements. Solo alarm handling allows service providers to focus on maintaining customer service levels by ensuring consistent alarm definitions, processing and escalation (minor, potential, critical) via LAN, WAN, or Dialup.

Multiple Host Reporting with Redundancy — The Solo-SEM platform gives service providers a reliable, flexible way to cost-effectively maintain 24x7 coverage and provide customers with service options such as reporting alarms to a second location, forwarding specific alarms to a 3rd Party contractor, or offering Solo-scheduled CDR polling to a specified host. Service providers can tailor multiple reporting options to ensure that the Solo-SEM system meets their business needs and their clients' requirements.

No Data Alarm — Solo can be configured to generate an alarm if no data is detected on a port. To prevent Solo from generating No Data Alarms during low activity days, like holidays, the user can set the schedule to exclude holidays or days of low activity (e.g. weekends).

Contact Alarms, Relay Outputs — Solo Multiport is equipped with 8 pairs of TTL inputs and 4 relay outputs which can be configured to report security alarms such as Door Open, Temperature, etc. as alarms. Events can also be matched to corresponding actions such as: Door Open→Sound Buzzer, Door Open→Activate Security Camera, Door Open → Notify Security, Temperature Too High → Notify Building Maintenance. Solo Multiport is an intelligent Point of Presence (POP) on customers' premises that service providers can use to develop value added service offerings and integrate 3rd Party offerings..

Self-Healing Repair Scripts — Based on a specified OEM alarm output, Solo can launch a script that will repair and restore service without human intervention. All interaction between Solo and the supported element is noted in the Solo event log. If an intervention by Solo is successful, the only record of the event is in the Solo log, but if the intervention fails Solo reports the critical alarm condition.

CDR Poll Schedule — Solo can be configured with a schedule that causes the Solo unit to dial out to a particular host and request that the host perform a poll on CDR data.

Real-time Toll Fraud Reporting — When operating in the call accounting mode, Solo can monitor CDR records in real time. If a particular call violates specified thresholds or conditions stored in a table, e.g. length of call, type of call, or destination of call, Solo can immediately initiate a toll fraud alarm to a specified location.

Solo Hardware Models

Solo Multiport is a powerful 5-port multi-application, multi-user unit ideally suited to support and monitor multiple network elements and environmental/security events. Solo has the power and performance to simultaneously process and handle alarms, traffic and CDR data while monitoring network SNMP traps. A DTE port supports external modem/terminal connection and the unit also provides a USB port. Versatility is enhanced with 4 pairs of Form C contacts and 8 digital outputs. Solo Multiport is equipped with dual Ethernet ports, a built-in 56K v.92 CCITT modem and can be optionally configured to include an ISDN interface or an external ADSL Modem and an internal hard drive for additional storage. Solo Multiport supports up to 5 simultaneous users and is fully operational on built-in backup battery for 2 hours.



Solo Trio, the newest member of the Solo Family, is a powerful, cost-effective 3-port + DTE, multi-application, multi-user unit for installations where support for multiple networks/elements is needed while contacts and digital inputs event alarms are not required. Solo Trio has the power and performance to simultaneously process and handle alarms, traffic and CDR data while monitoring network SNMP traps. Solo Trio provides a USB port, dual Ethernet ports, a built-in 56K v.92 modem and can be equipped with an external ADSL modem. Solo Trio supports up to 5 simultaneous users and is fully operational on built-in backup battery for 60 minutes.



Solo Jr is a cost-effective, high performance single application, single user unit that can handle CDR or alarms / traffic via a single serial port and at the same time, monitor network SNMP traps via an Ethernet port. A DTE port allows for external terminal connection. Solo Jr features an on-board 56K v.92 and can fully operate for 60 minutes on built in backup battery.

Specifications

Feature	Solo Multiport & DCU *	Solo Trio	Solo Jr
Operating System	VXWorks		
Real Time Clock	Yes +Time Zone with Daylight Savings Time		
Memory (FLASH)	128 – 512MB + Opt. HD	16 MB + Opt. 8 GB	16MB
RS232 Ports	5 addressable + DTE	3 addressable + DTE	1 addressable + DTE
Virtual Ports	4	4	1
Managed Element Ports	5	5	1
USB Ports	2	1	N/A
Ethernet Support	2 x 10/100 Mbps + opt. NIC	2 x 10/100 Mbps	1 x 10/100 Mbps
Analog Modem	56K v.92 with Caller ID + Optional 2 nd modem	56K v.92 Flex With Caller ID	56K v.92 Flex With Caller ID
** ISDN BRI Modem	PPP, ML-PPP, MP+, V.120, X.75, HDLC, CLEAR, PAP CHAP MD5 and Soft Bond channel protocols		
** ADSL Ext. Modem	Supports IPSec & IKE		N/A
Contact/Inputs	8 pairs TTL inputs 4 isolated relay outputs	N/A	N/A
Internal UPS	120 minutes operational	60 min operational	60 minutes operational
Local &Remote Special Reboot	Yes	Yes	Yes
Dimensions (H x L x W)	8.3 x 30.5 x 26 cm (3.26 x 12 x 10.2 inches)	4 x 28 x 17 cm (1.75 x 11 x 6.75 inches)	4.5 x 24 x 17.75 cm (1.75 x 9.5 x 7 inches)
Weight	4.52 Kg (10 lbs)	1.58 Kg (3.5lbs)	1.25 Kg (2.75 lbs)
Power	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz
Environment (Non-Condensing)	Temp. 10-35C (50-95 F) Relative Humidity 10-90%	Temp. 10-30C (50-90 F) Relative Humidity 10-90%	Temp. 10-30C (50-90 F) Relative Humidity 10-90%
Approvals	RoHS Compliant (EU and WEEE Directives)		
Safety	EN 60950-1: 2006 + A11 / ZEK 01.2-08 / 12.08 IEC 60950: 1999; UL 60950-1: 2003; CAN/CSA-C22.2 No 60950-1-03		
EMC/FCC	FCC Part 15, Subpart B, Class A – Unintentional Radiators CISPR 22:2003 + A1: 2004 + A2: 2006/EN 55022: 2003 – Class A Information Technology Equipment EN 300 386 V1.3.1 (2001-09) – ERM and EMC		

Note *: Solo DCU does not have an internal modem.

Note **: Optional

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