NEWNET PRODUCT BRIEF

Total Control STG

Secure high speed dial payment transaction transport system for carrier class transaction networks

OVERVIEW

The Total Control Secure Transaction Gateway-Dial version 3.0d (STGd) system is the next generation, market leading solution for carrier class transaction network service providers, acquirers, processors and payment service providers. This specialized software suite can enable fast transaction processing of credit card authorizations, debit card fund transfers, health benefit authorizations, electronic benefits transfers, and other communications involving single-session transfer of small amounts of data. It functions as a high density secure dial transaction aggregating, routing and switching system designed to run on industry standard, high performance 2U rack mount hardware.

The Total Control STG is designed for future expansion with two Intel Sandy Bridge processors onboard that support emerging technologies and applications with advanced high speed modem processing and DSP capabilities. The system is compliant with the latest PCI-DSS standards.

Total Control STG can be used for transaction processing over an IP network or over an X.25 network. The transaction gateway speeds transaction times with features such as Fast Connect, (reduces or eliminates steps such as alerting, audible ring, billing delay, answer tone, and call termination); and supports transaction protocols such as VISA I/II and Synchronous Data Link Control (speeds calls and reduces traffic to a processing host by up to 50 percent) with full protocol emulation. Total Control STG provides high density modem span capability with up to 8 E1/T1s optionally expandable to 16 E1/T1 in 2U form factor and can be stacked for up to thousands of DS0s.

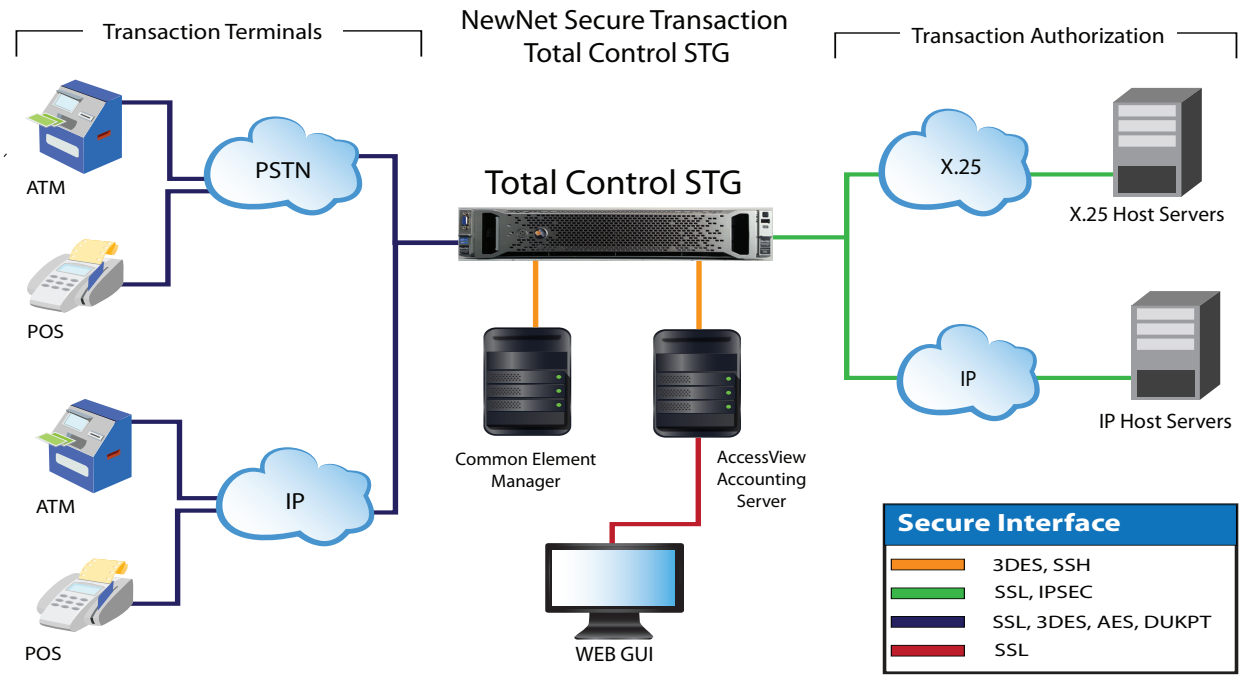

Figure 1: Total Control STG Aggregates Transactions From POS Terminals and Routes to Transaction Authorization Servers

STG in The Network

The Total Control STG connects transaction terminals to a host authorization system using TCP/IP and X.25 protocols. It acts as an intermediary, appearing to Point of Sale (POS) terminals as a host.

Reliability

Total Control STG system is designed to ensure no single point of failure for maximum uptime and higher availability. This modular platform is based on redundant modem and gateway applications on stackable rack servers. The system combines digital signaling processor (DSP) technology, secure transaction processing (switching and routing), and management software to provide fast, reliable connectivity using today's most advanced communication technologies.

Supported Protocols

The Total Control STG uses DNIS number or transaction data fields like TPDU NII to route debit, credit, POS, healthcare, and EBT transactions to the host server over IP networks. The transaction processing system generates transaction specific Call Detail Records (CDRs) and sends them to the Access View Accounting Server for transaction reporting, billing, monitoring etc. The system offers advanced IP routing for network traffic using network routing protocols (RIP, OSPF) and is compliant with PCI DSS standards and provides secure remote access using Secure Shell (SSH).

Figure 2: Total Control STG 3.0 System

Multi Span E1/T1 Card

The advanced design of the 8 E1/T1 multi span card enables multiple modem sessions, ISDN processing, on a single DSP - delivering high-level functionality in a small space. The card set can process 8 E1/T1 within each PCI-e slot.

The Total Control STG E1/T1 modem card features a fully reprogrammable DSP engine that can allow administrators to reconfigure the system to implement new technologies and applications. The multi span card supports a full range of trunk and communications standards, including V. everything, V.92, V.44 error correction, and many variations of CAS/PRI.

Gateway Server

The Total Control STG's modem card processes the packet contents of all digital and analog connections and routes E1/T1 transaction calls to the hosts. The rack server that hosts the application provides Gigabit Ethernet interfaces. Total Control STG system implements various transaction protocols like VISA I and VISA II. As an example, for asynchronous VISA transaction processing, this system supports the VISA configuration modes like Full Emulation, Full Emulation/No Acknowledgment, ENQs Only, ENQs Only No Framing, and Transparent. For a complete list of transaction protocols supported please refer to the user manual.

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Network Management Agent

The Total Control STG Network Management Agent provides SNMP-Based remote management capabilities including:

- Robust system HW/SW event and alarm reporting
- Configuration management
- Software Downloads without service interruption
- System parameter storage
- Rapid response to pre-configured system events

High Capacity in Small Form Factor

The Total Control STG supports up to 8E1 or T1 spans optionally expandable to 16 E1 or T1 spans in a 2U rack mount form factor and can linearly expand E1/T1 capacity with additional servers.

Clustered Architecture

Multiple Total Control STG systems can be deployed in a clustered architecture with load distributed across these systems along with high availability and redundancy. All the deployed systems can be managed from one location by a single web based management GUI. This provides for easy scalability – scaling up is simply a matter of adding new systems.

Unique Benefits

Reduce Traffic

The Transaction Gateway can act as an intermediary, appearing to Point of Sale (POS) terminals as a host, but communicating to the host using far fewer packets required than if the POS terminal(s) connected directly to the host. This reduces X.25 or TCP/IP network congestion and time spent by the host in handling responses, allowing the host to handle more calls per day. It also provides a means of connecting a wide variety of POS terminals to the same host by providing configurable protocol options on a per call basis.

Speed Up Transaction Processing

Generally, in industry standard processing gateways if two modems are using different baud rates, the faster modem will step down to the lower rate. Total Control STG supports fast-train protocol to retrofit lower rate modems and allow for them to communicate with higher baud rate modems at enhanced speeds. Fast train protocol significantly reduces the training times of 1200-bps and 2400-bps modems. Originating 2400-bps modems must support the proprietary fast-train protocol to receive 2400-bps fast-train benefits.

Features, Functions and Applications

Dialed Number Identification Service (DNIS) based Dial Transaction Routing

The Total Control STG maps Dialed Number Identification Service (DNIS) digits from the PSTN into specific Host Servers for IP connectivity; maps DNIS digits to specific TCP host and port numbers. This allows transaction-processing centers to use the rich addressing capabilities of both the PSTN and the IP networks together. For example, a center may choose to route transactions to different IP addresses depending on the transaction destinations.

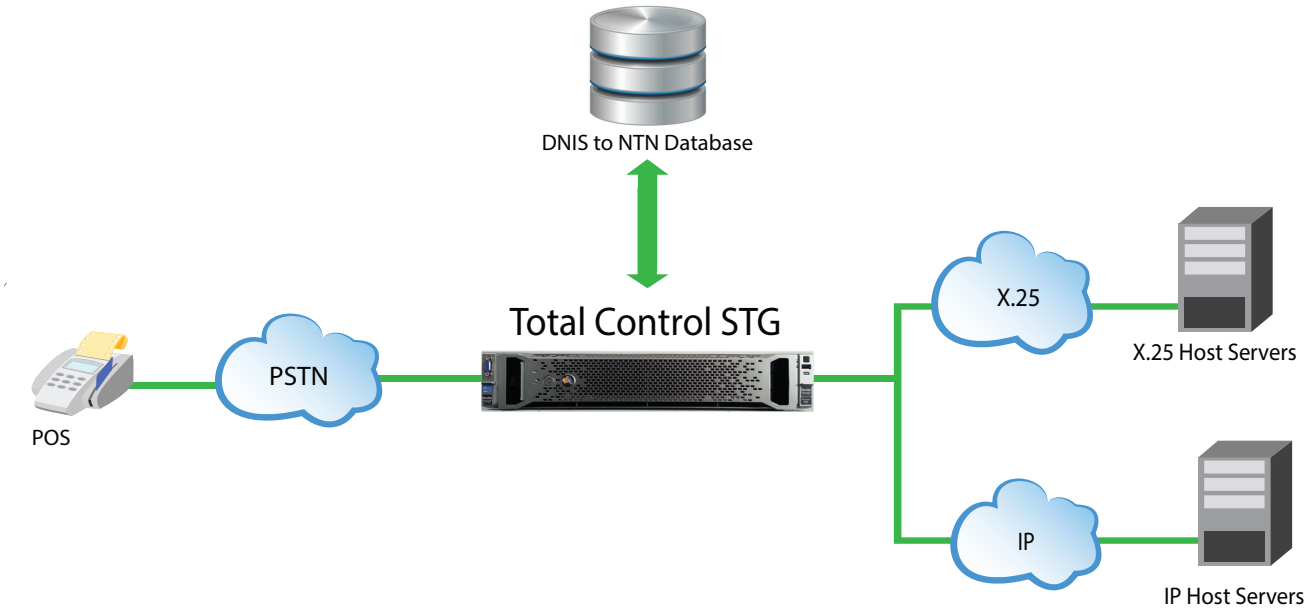

Figure 3: Dialed Number Identification Service (DNIS) with Total Control STG

As shown in above figure, if the transaction terminal dials a unique number identifying the credit provider, a system using the Total Control STG can map this number (using DNIS Group) to a particular TCP host and port number.

With the Total Control STG configuration mechanism users may define a DNIS configuration which specifies each PSTN DNIS-to-TCP host/port number. The Total Control STG currently supports 100s of DNIS entries, which can be "mixed" so that some dialed numbers invoke specific TCP host for ISO8583 or TPDU or VISA transactions.

Managing Large Networks

Once a desired configuration has been created for one system, it can be quickly cloned onto every other Total Control STG in the network. Most of the system parameters can be configured using the Common Element Manager (CEM) or a modem template may be used to configure only those parameters that cannot be configured through the CEM.

The Total Control STG configurations can be downloaded after the Total Control STG has come online. Downloading a new configuration does not affect ongoing calls unless the X.25 frame or packet level parameters are changed.

PPP Sessions

Total Control STG system continues the industry leadership of PPP RAS system as the world's leading enhanced data services platform. Its superior technology delivers high port density and performance for both E1/T1 trunks based calls, and ensures fast connections through every modem architecture available.

Protocol processing — such as PPP and TCP/IP — is distributed across the platform to eliminate throughput bottlenecks, and add modem cards for increased density to handle additional calls. Calls are then routed to 10/100/1000 Mbps or 1/10Gig Ethernet LAN ports to create a self-contained, wholly integrated remote access server. The advanced call handling and high capacity provided by the Total Control STG platform is always available through the system's use of redundant system configuration and hot-swappable power supply.

PPP handling on the Total Control STG covers a wide range of modem protocols including various high and low speed modulations. Radius Authentication and Accounting are supported using external Radius servers and can handle over 16xE1s of PPP traffic at any time.

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Redundancy and Load Sharing

E1/T1 Modem Redundancy and Load Sharing

The platform can be configured for redundancy or load sharing between the E1/T1 modem ports and PSTN. In the event of a specific modem span failure the platform can switch to the redundant pair. If preferred, additional modem spans may be used for load sharing.

Gateway Fail-Over Redundancy and Load Sharing Mechanism

The redundant gateways offer the ability to have load sharing mechanisms and failover for redundancy in the event of failure of one of the systems. This model avoids a single point failure and ensures a fully redundant solution as would be required for a high available solution for transaction processing systems that may be processing millions of transactions. The rack servers operate in a VRRP load shared and active- active mode for enabling load sharing and redundancy.

IP Redundancy

The TCP/IP configuration provides for a primary and a secondary host. If the primary host does not respond within the specified configured time frame, information is sent to the secondary host. STG supports IP network connectivity busy out feature. In this mode, the application continuously pings the target host. If no response is received for a period of time, the host is marked as down and the PSTN interfaces are busied out.

Redundant AC Power Supply

Redundant AC power supply guarantee maximum system uptime.

Total Control STG Standard Features

- VISA I/II Transaction Protocols and Processing
- Synchronous Transaction Protocol (ISO8583/SDLC) and Processing Batched Transaction Processing
- Per-call Configuration of Modem Parameters Based on Incoming DNIS
- Incoming Calls at Data Rates From 300 Baud to 56K
- TPDU Routing
- SSL/HTTPS to Host
- Secure Shell (SSH)
- T1, E1, and ISDN
- Auto Detection of Asynchronous Versus Synchronous Transactions
- Faster Modem Training Times Using the Proprietary “Fast Connect” Negotiation
- Routing Transactions Over Either an X.25 or an IP Network
- Performance Monitoring of Transaction Statistics Allowing Early Detection of Possible T1 or X.25 Trunk Problems
- Call Statistic Accounting X.25 Dial Out
- A Combination of Transaction Calls and X.25-only Calls on a Per-Call Basis
- EIS Standards 1051 and 1052
- CEM Integration
- PPP
- DNIS Based Transaction routing
- Automatic Shutdown Due to High Temperature
- Transaction Related SNMP Traps
- AC power

Key Features and Benefits

Feature	Description	Benefits
Transaction Protocol Support	Designed to accommodate all POS industry standards and supports all major transaction protocols - VISA I/ II, TPDU, ISO 8583.	Maximizes interoperability between hosts and POS terminals through ubiquitous support of transaction protocols. Allows Total Control STG to provide intelligent routing of transactions with a variety of payment transaction services.
Transaction Routing	Transactions can be routed based on specific fields in packet headers and payload fields. Capability to multiplex several transactions to host server on a single connection, maintained as persistent session.	Advanced routing ensures transactions are sent to the correct destination. Multiplexing balances transactions to avoid congestion and bottlenecks and diverts transactions around known failures.
Secure Access	Total Control STG supports SSL, IPsec, SSH and SCP cryptographic protocols that provide secure access, transfers and communication over the Internet.	Cryptographic protocols ensure that access to the system is completely secure.
Network Routing	The platform supports a suite of routing protocols - RIP, OSPF and BGP-4.	Helps network administrators configure IP routing to maximize system availability.
Load Balancing	Load balancing criteria include default mechanisms of round robin, pre-defined preference values, outstanding traffic or active load, ability to process transactions swiftly or response to delays. Load balancing can be applied on multiple Host servers configured in a Host group, or destinations defined for specific packet traffic.	Load balancing can be combined with routing protocols to ensure the traffic is distributed across the available paths. Intelligent routing increases system efficiency.
Virtualization	State of the art virtualization capabilities allows for segregation of traffic into groups and allocation of resources based on virtual traffic groups. Groups are defined on traffic type (TPDU, ISO8583), IP address/port, remote IP ranges and VLANs etc. Intelligent resource allocation ensures a group does not starve other groups of system resources.	Enables acquirers, processors and carriers to offer differentiated services on the same systems to multiple customers and still maintain complete isolation of capabilities and access controls.
PCI Compliance	- Build and Maintain a Secure Network - Protect Cardholder Data & stored cardholder data - Encrypt transmission of data across public networks - Maintain a Vulnerability Management Program - Implement Strong Access Control Measures - Restrict access to cardholder data by business - Assign unique ID to each person with computer access - Restrict physical access to cardholder data - Regularly Monitor & Test Networks - Track and monitor network resources & cardholder data - Regularly test security systems & processes - Maintain an Information Security Policy	Total Control STG insists on password protection for all users accessing systems including password control for system consoles and remote sessions. The system does not store any card data and all key information stored is encrypted. System access is restricted with access control lists and various levels of access. System changes are logged and made available for audit trail. Fail-safe model, leaves no options or user to create non-compliant configurations, mitigating security risks to offer fully compliant systems.
Group Monitoring	Systems has the ability to track and display the status of all Host servers in a group tracking status “active” or “non responsive”.	Allows NOC teams to react to status changes in a timely manner, administrating alerts before they turn into problems. Can be used to restore services of servers out of action.

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Key Features and Benefits

Feature	Description	Benefits
System Utilization	Detailed system resources utilization info including the processing resources, memory, interface status, traffic volume are available for tracking and monitoring	System management teams can proactively utilize this information for improving service.
Keep Alive Mechanism	Customized mechanisms for maintaining keep alive mechanisms between configured targets for status determination.	This feature is vital in ensuring the actual status to destination systems and making intelligent decisions on traffic re-routing.
Packet Filtering	Rules based packet filtering capability to filter traffic from avoidable sources or known/learned untrusted sources. Packet inspections for known patterns or signatures for early action to drop these before further forwarding.	Protects systems from known internet vulnerabilities and increase additional security layer over and above external firewalls.
Authentication	Radius, TACACS, LDAP based authentication.	Allows the use of a variety of external authentication servers.
DUKPT Encryption	Enables the terminal devices to offer advanced security capability for card data over and above the session security provided by the standard security protocols.	Enhanced security for card data which will still be secure over and above the session security.
Secure Shell	Authorized clients can connect to the internet via Ethernet interfaces on the TCSTG system. Access is authenticated and secured via Secure Shell-2 procedures.	All user access to the systems remains over secure access mechanism only.
Configuration	Offers ability to configure the system from the Common Element Manager tool (CEM) using graphical user interface or by CLI access to the system.	Full fledged capability to configure the systems in a carrier grade manner.

Interface with Access View Accounting Server

Access View is an integral part of the transaction-processing gateway. Access View captures accounting and network statistics from the Total Control STG, then processes and stores them in its database. Data captured by the accounting server can be used for the following operations:

- Transaction Accounting
- Transaction Monitoring
- Customer Billing
- Reports Generation

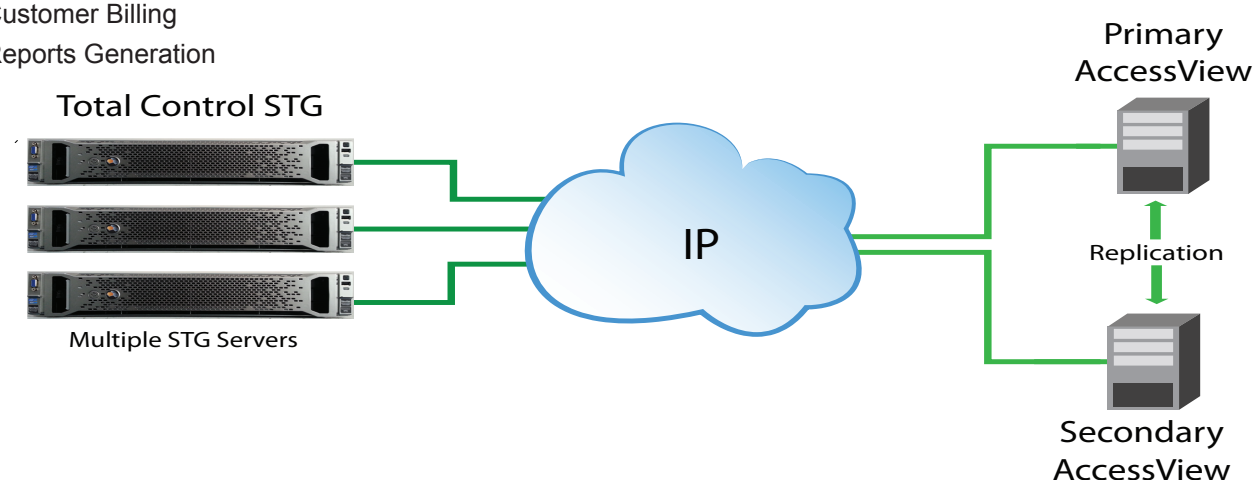

Figure 4: Multiple STG servers report to a redundant pair of Access View servers with live replication.

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Real-Time Viewing of Data & Reports

Real-time data are recorded to Access View at the end of each call. Customers can monitor and build a custom summary table using the most recent data in real-time. On a system-wide basis, transaction statistics can be used for traffic analysis according to time of day, system components, offered load, and transaction routes. Access View provides the convenience to generate various reports for planning and monitoring purposes.

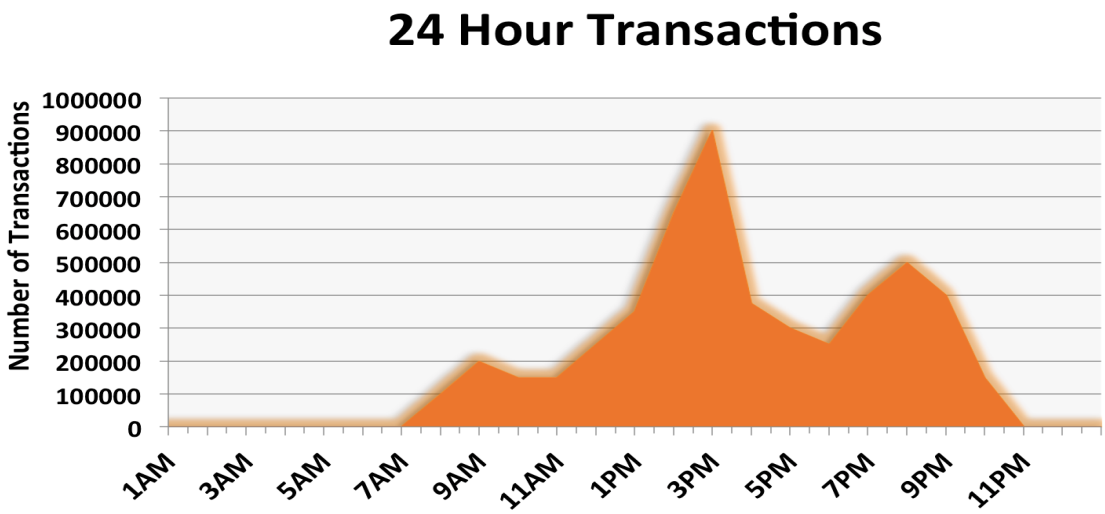

Figure 5: A graphical report from Access View, showing the number of transactions over a 24 hour period

Summary

The Total Control STG enables fast transaction processing of credit card authorizations, debit card fund transfers, health benefit authorizations, electronic benefits transfers, and other communications involving single-session transfer of small amounts of data. Carrier class transaction network service providers can reduce CAPEX and OPEX by deploying Total Control STG for transaction processing over a legacy X.25 network or over the next generation IP network. The rich features in the Total Control STG system provide new revenue generating opportunities for the network service providers.

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