Secure Transactions

ENSURING SECURITY FOR YOUR TRANSACTIONS

A NewNet Communication Technologies Solution Guide





Secure Transaction Solution Guide

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About NewNet

NewNet Communication Technologies, LLC is a global provider of innovative solutions for next generation secure mobile, broadband, web, dial payment transaction routing, switching and transport technologies. For over 30 years, NewNet has enabled global payment providers, Banks, Acquirers, Processors to rapidly deploy cutting edge, high security payment solutions needed to build, grow and improve payment transactions acquiring and processing. NewNet's Secure Transaction Transport solutions have reached millions of end users in over 90 countries.

NewNet Secure Transactions' broad range of products and services demonstrates our commitment to offer industry leading solutions in a constantly changing world.

Cloud Payment Acquiring & Transport

Payment transport, routing, switching and security solutions in the Cloud, both public and private with high security using Cloud HSM handling ISO 20022 with REST/XML





Cloud Security for Web, Mobile Payments

NewNet's high security payment solution with P2PE, Tokenization, Key Management capabailities, leveraging Cloud HSM for Mobile as POS for payments, Web commerce etc.

Products include the Secure Transaction Cloud (STC) with Cloud HSM in Azure, AWS Clouds



5G Mobile, IoT Payments in Edge, Core

Enables 5G mobile operators to rapidly build, manage and deploy cost efficient payment infrastructure ecosystems for own payment roles or managed services. NewNet solutions transport billions of payment transactions annually in system deployed globally.

Products include the STC along with Cloud HSM for the MNO environments to operate in the 5G Edge and Core environments



IP/Wireless/Dial POS/ATM Payment Routing/NAC

Enables secure payment routing for IP, Wireless, Dial POS transactions, Web/Mobile Payments, ATM transactions together with enhanced security solutiosn for P2PE, Tokenization for Acquirers, Processors, PSPs, Banks.

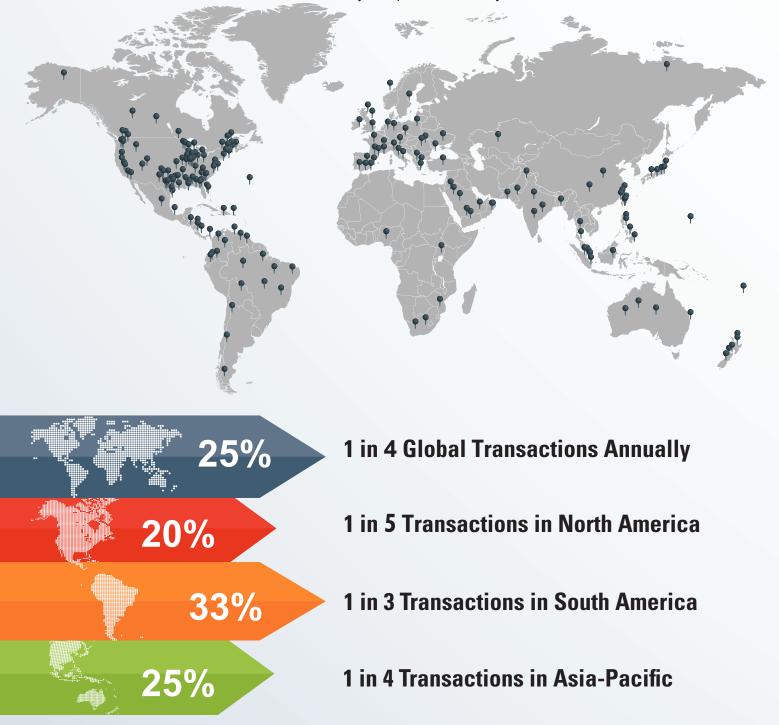
Products include the AG 1000, Secure Trasnaction Gateway, TransKrypt, CEM, AV



NewNet Global Footprint

NewNet Communication Technologies continues to be a global leader in providing innovative solutions for payment providers, next generation mobile and fixed line networks. NewNet has a customer presence across the globe, with service and support responsibilities for over 180 customers across 92 countries. NewNet Communication Technologies is headquartered in the United States with sales and support teams located around the world.

NewNet Secure Transactions offers Digital payment infrastructure with intelligent routing & switching solutions and cloud transformation for Acquirers, Processors, Banks, PSPs, Payment Gateways, PayFacs, MNOs, NSPs, FinTechs, CSPs etc., handling integrated payment transaction routing, secure network access, and payment data security utilizing flexible APIs, accepting omnichannel payments from Mobile, Web, In-Store, SmartPOS, mPOS, Ecommerce, Mcommerce & ATM transactions, fully compliant to security standards.



Secure Transaction Portfolio

Secure Transaction Cloud

Secure Transaction Cloud (STC) virtualized payment application with CloudHSM provide on demand access of secure payment network. compute and storage resources, and NFV based virtualized network functions for handling security, payment protocols, transaction routing. STC offers CloudHSM based secure Key, PIN, Token, Cryptographic function handling for EMV, P2PE, Tokenization etc for high capacity and highly scalable payment transaction routing and transport.

AccessGuard Mobile/Broadband Gateway

The AccessGuard 1000 solution is designed to transport millions of mobile, broadband IP based POS transactions, m-commerce and e-commerce payments transactions and mobile wallet payments. AccessGuard delivers the fundamental security capabilities needed to enable safe and reliable transport of financial transactions, security verification, or any data which requires high levels of data encryption over many network types. Designed with flexibility in mind, AccessGuard 1000 can also process non-financial based transactions, including business to business verifications, security verifications, point to point encryption, and a variety of custom applications that require the highest level of security.

Total Control STG

The Total Control Secure Transaction Gateway (STG) is NewNet's next generation solution for carrier class transaction network service providers. Leveraging the widely deployed Total Control platform, the Total Control STG offers a small form factor for dial and IP payment transaction switching and routing powerhouse with great emphasis on performance, scalability, and security. Integrating with network management, monitoring, configuration handling, statistics, billing, and reporting applications, the Total Control STG system expands the opportunities for customers to avail new generation application services.

Accounting & NW Management Products

The AccessView Accounting Server and AccessGuard 1000 Mobile/ Broadband Gateway System are an integral part of NewNet's transaction-transporting suite of products. The AccessView captures accounting and network statistics from the Secure Transaction Gateway-dial Transaction Gateway which supports subscriber billing, transaction recording, report generation, network performance monitoring, and system modeling and measurements.

The Common Element Manager System (CEM) provides flexible, centralized management for the Secure Transaction family of products. This powerful solution enables performance, fault, and configuration management of single and multiple Secure Transaction Gateway-dial and AccessGuard 1000 chassis and their components in all NewNet Communication Technologies base service environments.

TransKrypt Security Server

TransKrypt provide enhanced security facilities against card data breaches faced by the payment industry, with comprehensive Point to Point Encryption (P2PE) and Tokenization capabilities.

SECURE TRANSACTION PORTFOLIO PRODUCT HIGHLIGHTS

Secure Transaction Cloud

- · Dynamically scalable, elastic cloud based trasnaction routing application
- High security with CloudHSM and performance for 2-6 Million trabsactions/hour per instance

AccessGuard 1000

- Fast, safe, and reliable transport of high levels of data encryption.
- 5.4M 10.8M Web, Mobile/IP POS transactions per hour

Total Control STG

- Designed to run on high performance 2U rack mount hardware
- 1200 E1/T1 ports in 5U Rack Space
- · 720,000 transactions per hour

TransKrypt Security Sever

- Advanced crypto for Point to Point Ecnryption (P2PE) for end-to-end security
- Tokenized transactions to avoid sensitive data from being transferred

AccessView Accounting Server

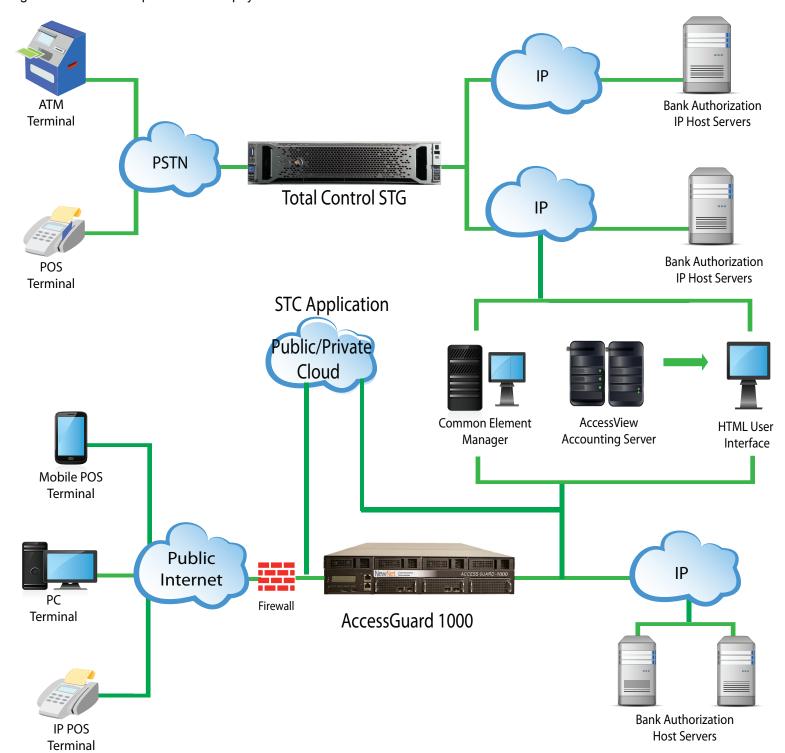
- Data captured supports subscriber billing, transaction recording, report generation
- Network performance monitoring, system modeling, and measurements

CEM System

- · Common Element Management Solution manages the Secure Transactions portfolio
- · Enable operators to customize the management solution

Secure Transaction Product Portfolio

NewNet's Secure Transactions product portfolio enables customers to securely and efficiently participate in the enormous growth and revenue potential in the payments market.



Accounting & Network Management

Real-time Call Detailed Records are captured by the AccessView reporting server at the end of each call. Network Operators can monitor and build a subscriber summary table using the most recent data. On a system wide basis, transaction statistics can be used for traffic analysis according to the time of da, system components, offered load, and transaction routes.

THE SECURE TRANSACTIONS PORTFOLIO IS AN ENCOMPASSING SOLUTION FOR SECURE, HIGH PERFORMANCE & HIGHLY SCALABLE PAYMENT TRANSACTION NETWORKS

HIGH SECURITY

- · PCI-DSS compliant
- · Advanced Cyptographic Technology
- · Highest level of encryption
- P2PE with Tokenization

HIGHLY VERSATILE

Integrated processing of payment methods using dial, broadband, mobile terminals, mobile wallets, secure web payments and NFC

COMPREHENSIVE

Designed to process transactions from credit, debit, prepaid or gift reward cards

Why NewNet Secure Transactions?

Secure Transactions Leads The Payment Ecosystem

NewNet's Secure Transactions solutions are an integral component of the payments ecosystem, whether the payment is from the swipe of a credit card or the tap of a mobile wallet enabling a phone at any Point of Sale (POS) device. Our comprehensive solutions process transactions from credit, debit, prepaid, or gift reward cards.

The Secure Transactions product portfolio, is an all encompassing set of solutions for the implementation of secure, high performance and highly scalable payment transaction networks. The product portfolio is an integral component used by banks, transaction acquirers, payment processors, retailers, financial institutions, educational networks, fixed an mobile communication service providers, Independent Sales Organizations (ISO's), and governments for building secure payment networks.

Develop With High Security Standards

Secure Transactions Solutions are PCI DSS compliant and perform high speed payment routing based on patented technologies enabling faster transaction completion with cutting-edge hardware acceleration. The solutions offer advanced cryptographic technology to provide the highest level of encryption, ensuring secure transport of transaction flo.

Mobile Payments

NewNet's Mobile/Broadband gateway platforms not only provide secure interfaces for the transactions emanating from mobile payment devices, but also provide continued secure routing and transport as the transactions are delivered for further processing in additional nodes and servers in the carrier or financial processors network. The flexible gateway implementation provides the capability to handle mobile transactions using a variety of protocols, with the ability to incorporate any new and additional requirements with a simple software update. The solution thus offers unique services necessary for mobile carriers or merchant acquirers and processors to deploy advanced mobile payments such as NFC payment systems, mobile wallets etc.

Power Efficient, Small Footprint & Eco-friendly Green Products

The unique NewNet Secure Transactions Portfolio provides integrated capabilities of secure transaction processing, protocol processing, and flexible network routing in a single system implementation. For dial access, the NewNet systems supports industry leading capacity of 16E1/T1 ports per box with the ability to support routing for legacy X.25 or IP based transport to processor infrastructures. The fully integrated IP mobile/broadband gateways provides SSL termination, SSL off-loading, transaction protocol processing, and transaction routing in a highly scalable package. With a single system, it has the ability to process over 2 million transactions in an hour.

Expanding Beyond Payment Transactions

The innate secure processing and high performance capabilities of the NewNet Secure Transactions solutions are now being extended to deliver secure processing of electronic benefits data, medical data, and insurance information in m-health applications. These applications bring the ease of secure electronic processing and delivery to new applications driven by the explosive growth of smart card and smart device technologies.

Solutions For A Broader Payment Ecosystem

Acquirers, Processors, Banks & Financial Institutions

NewNet Secure Transactions Solution Suite empowers acquirers, processors, banks and financial institutions to efficiently deploy a fully integrated platform that performs SSL off-loading, transaction protocol processing, and transaction routing. With millions of end users, NewNet Secure Transactions Solutions enable traditional acquirers and processors with support for legacy host interfaces. In return, this bridges the gap between Mobile technologies for fast emerging NFC and mobile wallet payments.

MNOs and Carriers

NewNet Secure Transactions Systems offer key value added services and empower MNOs and Carriers to actively insert themselves into the payment ecosystem. Additionally the Secure Transactions platform allows for a smooth transition from dial to mobile or broadband IP based solution. The services available to the mobile operators include

- · NFC mobile wallet payment routing and processing
- · Merchant acquiring services
- Integrated card and carrier billed services
- · Alternative payment processing capabilities

Retailers, Hosted Service Providers and ISO's

With an active industry presence and cutting edge solutions, NewNet Secure Transaction systems enables retailers, hosted service providers and ISO's with integrated single platform solutions for multiple access based payment solutions with advanced security levels. NewNet provides industry leading Mobile, Broadband, and Dial payment solutions for legacy terminals and the most advanced POS payment devices.



Partnering With You To Develop An Optimal Business Model Tailored To Match Your Market Profile & Service Goals With Focus On Speed-To-Revenue

SECURE TRANSACTIONS CLOUD (STC) ENABLES HIGH SPEED, HIGH SECURITY TRANSPORT AND ROUTING OF PAYMENTS IN CLOUD

Dynamic Scaling

Scales the capacity with multiple cloud instances towards dynamically meeting increased transcation volume demands

Fast Transaction

High speed handling of transactions eliminating latencies and ensuring high speed crypto operations for quick completion on payment transactions

High Capacity

Single instances can handle upto 25Millions` transactions during peak hour enabling high capacity perfromance.

Redundancy

Provides maximum system reliability with load balancing, redundant components, and automatic failover.

Secure Transactions Cloud (STC)

Key features of the Secure Transactions Cloud (STC) are:

- "PCI compliant with Secure Shell (SSH) for remote access and management
- "TLS, IPsec, SSH, and HTTPS for added Security
- "ISO8583, TPDU, VISA, XML Transaction Protocols
- "Tokenization and P2PE
- "EMV Crypto, PIN Handling
- "Load Balancing Client and Host Interfaces
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Cloud Based Availability & Redundancy

Cloud computing for payment handling enables ondemand network access to a shared pool of computing resources` including networks, servers, storage, applications etc. that can be rapidly provisioned and availed with minimal management effort or service provider interaction, to facilitate payment transaction handling. Key characteristics of cloud services include on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service. Of the three service models possible with cloud services comprising Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (laaS) these services may be deployed as private cloud, public cloud, hybrid` cloud and community cloud, with multiple instances of the application being utilized for high availability and redundancy with automatic fall back for seamless continuity of payment services.

Virtualized High Capacity Performance

The virtualized capabilities on STC allow the solution to support the full plethora of payments rated at about 25 Million transactions per hour including internet payments, mobile payments, POS based transactions which are IP/Mobile access based and all forms of ecommerce and mcommerce payments with PCI standards compliant security. ith virtualized payment and security functions operating in the cloud infrastructure along with cloud HSMs, the security of the solutions remains the highest as stipulated by the standards bodies, with the strongest encryptions using long length keys, and crypto operations being handled completely within the HSM boundaries.

ACCESSGUARD 1000 BENEFITS



Integrated

Supports transaction transport, security off-loading, network routing and can be used with currently deployed POS terminals



Highly Versatile

Integrated transport of internet payment transactions, mobile POS transactions, and NFC mobile wallet payments



Scalable

Scales hundreds of payment terminals and supports thousands of terminals



Low Cos

Built with delivering high call density in 2U of rack space

AccessGuard 1000 Mobile/Broadband Gateway

The AccessGuard 1000 from NewNet Communication Technologies is designed to process millions of mobile or broadband IP based POS transactions and m-commerce, mobile wallet and e-commerce payments. The AccessGuard platform provides the fundamental security capabilities enabling safe and reliable transport of financial transactions, security verification, or any highly encrypted data across communication networks. The highly flexible AccessGuard solutions are being extended beyond payments transaction processing to support other customized applications such as business to business verification and point to point encryption that need the highest level of performance and securit .

Key features of the AccessGuard platforms include:

- Termination and off-loading of SSL security protocol processing
- · Support for Derived Unique Key Payment Transaction (DUKPT) and end to end custom security protocol processing
- Processing and interworking of transaction protocols such as VISA I, VISA II, ISO 8583 and TPDU
- · Seamless interoperability with legacy and next generation host processing systems
- · High performance protocol processing and routing
- · Highly scalability solutions scaling
- Up to 2M transactions per hour with future upgrades to support over 10M transactions per hour on a single system
- From a few hundred payment terminals to supporting tens of thousands of terminals

Versatility with Security

AccessGuard offers the capability to route payment transactions to any authorization server based on multiple criteria including shortest path, server availability, server traffic, pending transactions, least cost network route, network availability, etc. This system also offers the option to route transactions in real time to specific destination servers based on user specific rules. Specific configurable rules that can be supported involve routing based on transaction typ transaction values, location, charges, and may be expanded for custom required parameters. Products sold in financial transaction markets require strict adherence to regulatory and agency approvals. The AccessGuard is compliant with PCI DDS security requirements. We also support financial transaction protocols like VIS—I and VISA II, which provide opportunities to offer more value added services. AccessGuard offers enhanced data security support for the DUKPT standards used for encrypting transaction data from IP payment terminal and mobile payment devices.

Bringing Existing into the Future

The AccessGuard 1000 securely interconnect new or legacy banking servers with mobile broadband IP POS or payment terminals, while safeguarding sensitive data during transit over the public internet or private network. AccessGuard offers seamless support for existing transaction protocols with authorization servers. This allows acquires and



processors to utilize existing servers used for offering dial transactions and extend it to support mobile transaction.

THE TOTAL CONTROL STG ENABLES FAST TRANSACTION PROCESSING OF CREDIT CARD AUTHORIZATIONS AND SINGLE-SESSION TRANSFER OF DATA

Latest Standards

Supports the most recent Visa I/II, Synchronous transaction protocol ISO 8583, TPDU and PCI DSS standards.

Fast Transaction

Reduces modem hand shake time by 70% - 75% and connection time by as little as 1 second while reducing costs

High Density

Single unit hardware that is simple to deploy and manage. STG 2U systems support up to 16 T1/E1s and can be stacked for linear capacity expansion.

System Redundancy

Provides maximum system reliability with load balancing, redundant components, and automatic failover.

Total Control STG

The NewNet Total Control STG Solutions are the next generation, market leading, carrier class solutions for payment transaction aggregation, switching, routing and transport in service provider networks. The new and improved platforms, which incorporate a specialized software suite, offer customers the ability to deliver high performance, cost effective and highly competitive end-to-end network solutions to the electronic payment transaction industry. The platforms 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. In addition, 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.

Key features of the Total Control STG are:

- · PCI DSS compliant with Secure Shell (SSH) for remote access and management of the system
- Fast Connect
- · Processing and interworking
- · Synchronous Data Link Control
- · DNIS number or transaction data field
- IP or legacy X.25 packet network
- Generation of transaction specific call detail record

No Single Point Of Failure

The Total Control transaction gateway provides maximum reliability with redundant systems that can be used in the load balancing mode for normal operation but will switch to a fail over mode when there is failure of one of the cards to provide continued system operation. The systems switch back to the load balancing mode upon fault restoration. Redundant DSP cards can be included in the system and can be used as backup to take over the call processing in the system in the event of failure of the primary card.

A Powerful High-Density Platform

The NewNet Communication Technologies Total Control transaction gateway products are powerful high-density platforms designed for processing hundreds of millions of transactions. The Total Control STG is designed to run on industry standard, high performance 2U / 1U rack amount hardware and is scalable by stacking more boxes as traffic increases. The transaction gateway platforms reduce the modem handshake time by 75 percent and connection time by as little as one second, speeding transaction times and reducing costs.



TransKrypt Security Server

Security of transactions is critical as the volume of payments are growing at a faster pace from new generation mobile and broadband based IP payment terminals and devices. NewNet's TransKrypt Security Server is a comprehensive security server solution aimed at offering multiple security solutions which are crucial to payment transaction processing.

TransKrypt Security Server offers the following security functions of Point to Point Encryption(P2PE), Tokenization. The solution offers Point to Point Encryption(P2PE) for supporting data encryption from POS/POI terminals, and Tokenization of card and sensitive data for payment transactions. Secure cryptographic devices used for cryptographic-key management functions and/or the decryption of account data are host/hardware security modules (HSMs), which are approved and configured to FIPS140-2 (levels 2 & 3).

Point to Point Encryption

Tokenization

Tokenization solution uses HSM module which is a tamper proof device to store keys used for the tokenization. The HSM module ensures that the encryption keys and sensitive data reside on a secure device and cannot be accessed or tampered with without destroying the module. The tokenization solution need to be installed in a secure location and will interface with other authorized systems using TLS/SSL with valid certificates. Merchants can use the tokenization solution to reduce the PCI-DSS scope by storing transaction reference data with a token instead of the PAN, as recommended by PCI.

TransKrypt Advantages

Hardware Security Module

TransKrypt Security Server utilizes FIPS 140-2 Level 2 HSM solution to store sensitive data like encryption keys securely and provide encryption and decryption capabilities.

Security Standards Compliance

Compliant to the PCI Security standards for P2PE systems for the process of decrypting the transaction data and generation and storage mechanism for the keys used for obtaining the unique keys per transaction.

Reduction of PCI Scope

TransKrypt systems limits PCI scope for participating merchant entities within the payment ecosystem by limiting the sensitive data storage, reduces merchant vulnerability, and improves payment security of the overall transactions

Accounting & Network Management Products

Common Element Manager

The Common Element Manager System (CEM) is a network element management solution that is used to manage the Secure Transaction Portfolio. The Java based CEM features an easy to use graphical user interface to view system status and availability at a glance. The Java 2 SE v1.5 implementation enables service providers to use a compatible server platform of their choice. The system provides open XML interface and scripting application interfaces to enable operators to customize the management solution and rapidly deploy the solution.

AccessView Accounting Server

The AccessView Accounting Server, an integral part of the Secure Transactions product portfolio, captures accounting and network statistics information from the Total Control STG and the AccessGuard gateway solutions. The AccessView then processes and stores the information in a database, to support subscriber billing, transaction recording, report generation, network performance monitoring, and system modeling functions in the network. The collation of per customer data provides critical data for billing customers as well as to provide operators insight into the customer usage patterns. The per transaction data provide system operators the granularity to track performance statistics and help pinpoint any network anomalies or issues. The data can also be used for additional offline analysis applications such as fraud detection. Both Windows and Solaris versions of this application are now offered to cover a wider customer base.

Accounting & Network Management Advantages

01

Real Time Monitoring

Real-time data is recorded by AccessView at the end of each call. Network operators can monitor and build a subscriber summary table using the most recent data.

02

Simple Interface

Simple graphic interface that enables network operators to view system status and device availability at a glance.

03

Real Time Statistics

On a system wide basis, transaction statistics can be used to pinpoint key performance indicators, such as system components, offered load, transaction routes and the time which it occurred.





NewNet Secure Transactions Professional Services

Our highly experienced professional services team has proven processes with innovative technology to ensure that customers launch their services on time and on budget. Our expertise enables you to maximize the competitive advantage and efficiency for your Secure Transactions portfolio.

Services For NewNet Secure Transactions

The NewNet services team is a highly experienced team of services professionals with proven processes and innovative technology to ensure that customers launch their services on time and on budget. At launch, NewNet provides a wide range of services that help you deploy and manage applications to monetize the network, and a service delivery platform to enable an application ecosystem. We also have the expertise to manage your network, with flexible options based on your requirements and business model.

Our service professionals are in every region of the world, and there is no place too remote for us to help you. With our proven industry leading experience in successful multi-vendor, multi technology secured environments, NewNet is ready to assist you every step of the way to make your project a success. Our services have been tried and tested to supply complete payment transaction solutions as the market moves towards cloud based and third party managed services. This expertise enables you to maximize the competitive advantage and efficiencies for your unique payment processing solutions based on the foundation of the Secure Transaction product portfolio.

Plan & Design

- · Determine Requirements
- Volume Predictions
- · Network architecture

Integration & Communication

- System Integration
- System Level Test
- Validation
- Application Testing
- · Interoperability Testing

Assess & Consult

- Service Requirements
- Business Case Analysis
- Technology Evaluation
- Preliminary Design
- Trials
- Program Management

Operations

- System Level Statistics
- 24x7 System Support
- · Installation Success Rate

Optimization

- Collect Data
- Analyze Performance Data
- Feedback Growth Planning
- Training

Deployment

- System Integration
- System Level Test
- System Level Validation
- · Application Testing
- Interoperability Testing



About NewNet Communication Technologies

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NewNet specializes in Secure Transaction Transport, Mobile Messaging, Interactive Voice Response, Real Time Charging and Rating, Wireless Broadband and Network Optimization solutions that have reached millions of end users in over 90 countries.



Visit www.newnet.com to learn more about the NewNet
Secure Transaction Portfolio which transports

1 in every 4 transactions around the world.

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