ST40

STARENT NETWORKS

MULTIMEDIA CORE PLATFORM

INTELLIGENT *PERFORMANCE*

www.starentnetworks.com

STARENT NETWORKS

The ST40 meets and exceeds the strong demand for bandwidth-intensive, multimedia services that support next-generation networks with subscriber intelligence, world-class performance, In-line services, and high throughput call control.

Today's mobile subscribers are responding to new dynamics in the market where content, information, and entertainment are increasing their desire to stay connected. Subscribers are no longer satisfied with basic data services; they want a superior experience that they associate with a broadband multimedia environment.

As a mobile operator, you've provided a multimedia environment with messaging, ring-tones, Internet access, and initial video and audio service. As a result, you've started to realize gains in data average revenue per user (ARPU). However, this is just the beginning. Advanced, interactive multimedia services, such as streaming music, video downloads, mobile office, instant messaging, and IPTV, will further increase usage of multimedia services and have the potential to become a substantial percentage of your profits.

In order to deliver a superior subscriber experience, you must build a high-capacity, broad-band, 3G network, while significantly improving control of individual subscriber sessions. This network must handle bandwidth intensive, real-time multimedia services, such as voice, video, and TV — all the while preparing to transition to 4G technologies as they mature.

This network starts with the system intelligence and high performance of the Starent ST40 multimedia core platform.

A Legacy of Market Leadership

The ST40 builds upon the multimedia core platform leadership Starent established with its ST16 — a field proven platform deployed in many of the world's most advanced mobile networks. The ST40 was designed to meet the needs of large, high demand, multimedia networks.

An Intelligent Multimedia Core Solution

The ST40 is a world-class platform that uniquely combines high capacity, high availability, and powerful performance with unparalleled subscriber and network intelligence. With these capabilities, the ST40 promises to become an essential part of your multimedia core network as you look to support tremendous growth in multimedia services while planning for next-generation, 4G technologies.

The ST40 is the new benchmark for deployment in today's and tomorrow's multimedia-enabled core network. The ST40 utilizes a simple, flexible network architecture that allows you to support multiple access technologies, subscriber mobility management, and call control capabilities, as well as unique In-line Services. With its throughput and capacity, the ST40 is ideally suited to support the following, network functions:

- Gateway GPRS Support Node (GGSN)
- Serving GPRS Support Node (SGSN)
- Packet Data Serving Node/Foreign Agent (PDSN/FA)
- Home Agent (HA)
- Access Service Network (ASN) Gateway
- Session Control Manager
- Call Session Control Function (CSCF)
- Security Gateway
- Mobility Management Entity (MME)
- Serving GW (S-GW)
- PDN GW (P-GW)
- others

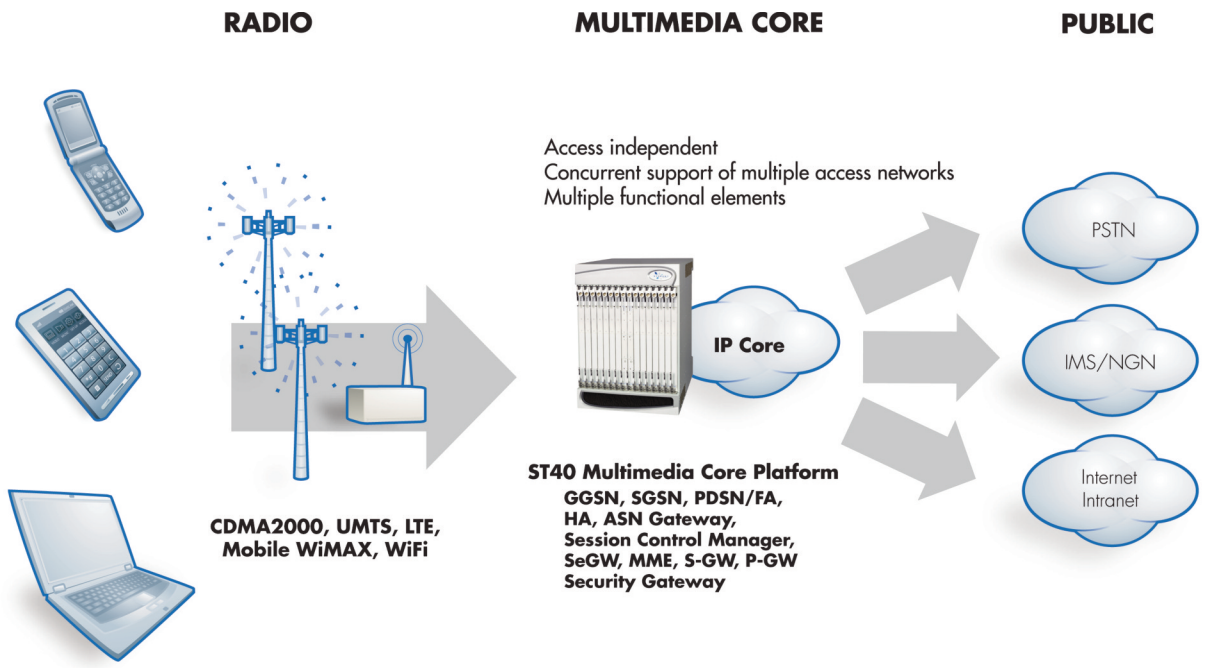

FIGURE 1

Starent ST40 Multimedia Core Platform provides multi-service, multi-access capabilities for the next generation wireless broadband multimedia core network.

The ST40 is an access independent solution that can be seamlessly deployed in various mobile networks, including CDMA2000, 1xEV-DO, UMTS, LTE, WiFi, and Mobile WiMAX, while also being IMS ready.

Intelligence at Work

Key to creating and delivering differentiated services—and meeting subscriber demand—is the ST40's ability to recognize different traffic flows, which allows it to shape and manage bandwidth, while interacting with applications to a very fine degree. The system does this through its session intelligence that utilizes deep packet inspection (DPI) technology, service steering, and intelligent traffic control to dynamically monitor and control sessions on a per-subscriber/per-flow basis.

The ST40's interaction with and understanding of key elements within the multimedia call—devices, applications, transport mechanisms, policies—and assists in the service creation process by:

- Providing a greater degree of information granularity and flexibility for billing, network planning, and usage trend analysis
- Sharing information with external application servers that perform value-added processing
- Exploiting user-specific attributes to launch unique applications on a per-subscriber basis
- Extending mobility management information to non-mobility aware applications
- Enabling policy, charging, and Quality of Service (QoS) features

The ST40 Multimedia Core Platform Architecture

The ST40 multimedia core platform incorporates powerful technology with innovative design. The ST40's distributed architecture, high-performance capabilities, service assurance, and subscriber awareness set it apart from the competition.

The ST40's distributed architecture features a blend of high performance processing, significant memory, and powerful switch fabric to more intelligently and reliably handle mobile sessions. Unlike other platforms, call control and packet forwarding paths are separated on different control and data switch fabrics. This reduces the number of traffic flow inefficiencies, which diminishes latency, and ensures faster call setup time and hand-offs. With the platform's distributed system, all tasks or services can be allocated across the entire system. This unique approach allows mobile operators to deploy more efficient mobile networks that can handle a greater number of concurrent calls, optimize resource usage, and deliver enhanced services, while also providing easy scalability.

The ST40 platform employs full hardware and software redundancy, as well as high-availability software techniques, such as session recovery, fault containment, and state replication. Built upon our intelligent system, these self-healing attributes anticipate faults and provide quick, non-service disrupting recovery to maximize network uptime, maintain user sessions, retain billing information, as well as ensure a high-quality experience.

Service Availability Features:

- Session recovery
- Fault containment
- State replication
- Task checkpoint and migration
- M:N or 1:1 redundancy for all hardware elements
- Dynamic hardware removal and additions — hot-swappability
- Inter-chassis or geographic redundancy between multiple platforms

In-line Services Enhance Performance, Simplicity, and New Service Opportunities

As subscriber appetites for mobile multimedia continues to grow, you must provide enhanced network capabilities through services, such as enhanced charging, firewall protection, peer-to-peer detection and control, content filtering, virtual private networking, and many others.

The ST40 platform enables integration of these In-line Services with multimedia core functions, such as PDSN, MME, S-GW, P-GW, HA, GGSN, ASN Gateway, Session Control Manager, and others. The ST40 can support multiple In-line Services in the same chassis — something competing solutions can't achieve.

By deploying services "In-line" with the core functions, the network achieves a higher degree of optimization, lower operating expenditures, and higher levels of service assurance.

Additionally, In-line Services at the network edge to increase network scalability through simple distributed service deployment, reduce latency by streamlining the network, and protect subscriber sessions through deployment on a secure platform.

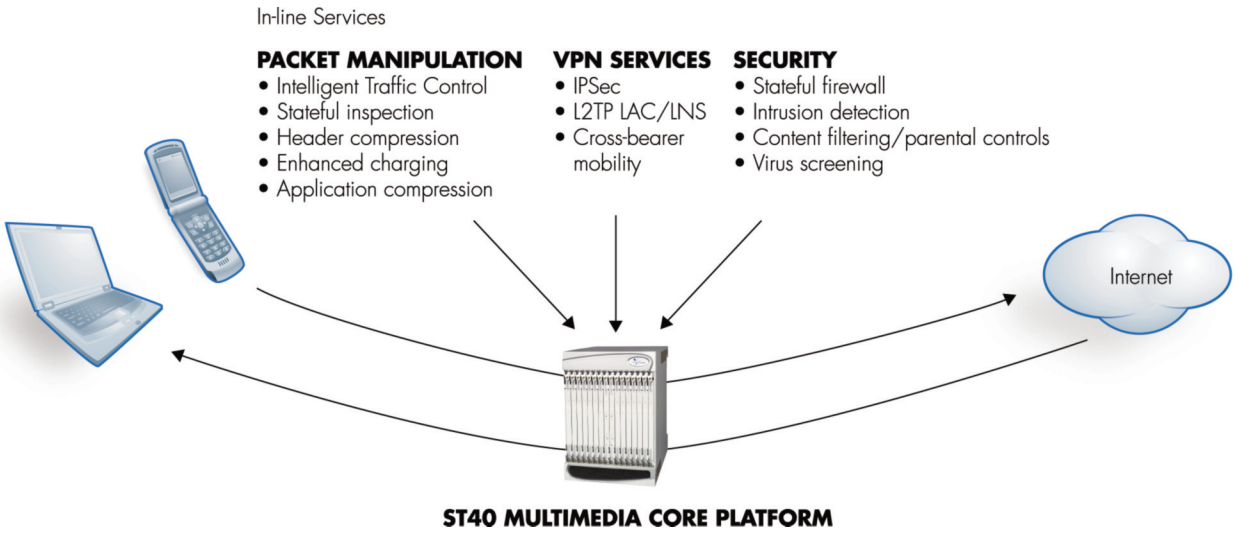

FIGURE 2

In-line Services simplify network topology, reducing latency and offering shorter time-to-market and increasing profitability.

As subscribers and services migrate to an "all-IP" infrastructure, security becomes paramount. The ST40 employs the latest encryption and security software and firmware for the vital protection of subscriber sessions. Various authentication protocols are used to secure network access to valid subscribers and IPSec encryption and termination provides a secure and private session.

Powerful and Flexible Platform

Why is the ST40 the gateway to better business? Here's a quick look:

Rapid deployment of new services

Support of packet-based voice, data, and multimedia traffic delivers innovative next generation services to create new revenue streams — and gives you a competitive edge

High density, high bandwidth

The ST40's powerful chassis easily scales to meet the demands of the very largest networks while achieving requirements for next-generation services and subscriber levels

Deep user understanding

Intelligent recognition of traffic and control flows via DPI technology allows for targeted services

Flexible billing, increased profitability

In-depth examination of packets during processing via DPI technology opens tiered and detailed billing options

Service support reduces complexity and costs

In-line Services streamline performance while improving infrastructure and support costs

Access independent
With support for CDMA2000, UMTS, WiFi, and Mobile WiMAX in the same chassis, the ST40 is the only platform to provide converged, universal access to all mobile access technologies

A future-proof foundation
The ST40's ample memory, broad bandwidth, and powerful processing allow the system to grow with the needs of the next generation network, making it easier to migrate to a robust "all-IP" infrastructure

Always on
High-performance packet forwarding, distributed processing, redundant hardware, and self-healing and session recovery features all ensure five 9's availability, inter-chassis and intra-chassis handover for higher reliability, provides greater subscriber satisfaction

Maximum security solution
Apply customizable encryption and traffic filtering to protect subscribers and applications without impacting overall performance

Easy to deploy, easier to manage
Distributed architecture and web-enabled management applications allow for fast and easy configuration, expansion, and troubleshooting

Application and Line Cards
The chassis features 16 front-loading slots for application cards and 32 rear-loading slots for interface cards.

- System Management Card (SMC): full system control and management of all cards within the system
- Packet Services Card (PSC): high-speed, multi-threaded PPP/PDP context processing capabilities
- Packet Services Card 2 (PSC2): higher-performance version of PSC card
- Switch Processor Input/Output (SPIO): connectivity for local and remote management, and central office (CO) alarms
- Gigabit Ethernet, 10 Gigabit Ethernet, Fast Ethernet, ATM, DS3 Line Cards, STM1/OC3: physical interfaces to elements in the data network
- Redundancy Crossbar Cards (RCC): utilizes 5 Gbps serial links to ensure connectivity between line cards and every PSC in the system for redundancy

Enhanced Operating System and Management
The ST40 multimedia core platform uses Starent's own StarOS™ operating system, a customized, real-time version of Linux® that provides a robust and highly flexible operating environment. The system is designed to distribute and manage sessions across the entire ST40 platform.

The following are key capabilities of the system:

- Application hosting capabilities
- Modular distributed processing
- High-availability features
- Robust development environment
- Context support allowing multiple logical systems to exist in one chassis

The ST40 offers multiple options for both local and remote management:

- Command Line Interface (CLI) supporting telnet, SSH, and local login through a console port
- Web management using an advanced CORBA-based application
- SNMP support for event notification

The ST40 provides device and system-level management that can be integrated into operator's existing management platforms for pinpoint fault isolation, configuration, accounting, and security capabilities.

Technical Specifications

Interfaces
- Gigabit Ethernet
- 10 Gigabit Ethernet
- Fast Ethernet
- ATM
- DS3
- STM1/OC3

Physical Dimensions
- Height 24.50 in. (62.23 cm)
- Width 17.5 in. (44.45 cm)
- Depth 24.0 in. (60.96 cm)

Weight
- Empty – 99 lbs. (44.90 kg)
- Fully populated – 319 lbs. (144.70 kg)

Power
- Load sharing, hot swappable – 48VDC power filters with redundant power circuitry throughout

Environmental Information
- Operating temperature 0°C to 55°C
- Operating humidity levels 20 to 80% non-condensing

Redundancy
- 1:1 or M:N redundancy for all system cards
- Integrated hardware and software redundancy with automatic failover features
- Optional session recovery support
- Optional inter-chassis session recovery
- Optional geographic redundancy support

High Capacity Design
- Self-healing 320 Gbps packet-based Switch Fabric
- Support for internal hard drive
- System Management Bus
- 32 Gbps Control Bus
- 140 Gbps Redundancy Bus

Certifications

Safety
- UL60950—Standard for Safety for Information Technology Equipment, 3rd Edition
- European Union EN 60950 (CE Mark)

Electrical
- Telcordia GR-1089-Core, Network Equipment-Building System (NEBS) Requirements: Electromagnetic Compatibility and Electrical Safety Criteria for Network Telecommunication Equipment (NEBS Level 3 Certified)
- FCC, Part 15 B, Class A Requirements for Non-residential Equipment
- ETSI EN 300 019
- ETSI 300 386
- ETSI/EN 300 386-2 Electrical Fast Transients
- SBC TP76200MP

Environmental
- Telcordia GR-63-Core, Network Equipment-Building System (NEBS) Requirements: Physical Protection

Other
- Taiwan Bureau of Standards, Metrology and Inspection (BMSI)

Compliance
- Restriction of Hazardous Substances (RoHS) 5/6 Compliant (Directive 2002/95/EC)
- Waste Electrical and Electronic Equipment (WEEE) (Directive 2002/96/EC)

STARENT NETWORKS

Starent Networks, Corp.
30 International Place
Tewksbury, MA 01876
T: +1-978-851-1100
F: +1-978-640-6825
www.starentnetworks.com

Rev. 0509