Starent’s Serving GPRS Support Node (SGSN) has become the choice for many of the world’s most innovative 3GPP network operators deploying GSM, UMTS, and HSPA networks. The Starent SGSN offers full UTRAN/GERAN to 3GPP core network access support in order to perform mobility management, GPRS Tunneling Protocol (GTP) tunneling and detunneling, Packet Data Protocol (PDP) context activation and management, attaches and detaches, and billing.

Supported on our ST40, which is now the Cisco ASR 5000, the Starent SGSN provides comprehensive, high capacity, and standards-compliant GSM/GPRS, EDGE, UMTS, and HSPA network access support. By performing IP-based transport on all radio and core network interfaces using standard interfaces, the Starent SGSN’s performance and scalability is enhanced, while inter-connectivity complexity is reduced, providing operators with higher performance for less operational expenditure.

Additionally, the SGSN supports network migration towards HSPA networks, and eventually, can be upgraded to a Release 8 SGSN that will allow interoperability with the Mobility Management Entity, or MME, and the Serving Gateway in Evolved Packet Core networks.

Is your network ready for the massive increase in mobility events from the movement to “always-on” applications, flat IP network architectures, and the mobile broadband tidal wave? Are you tired of supporting multiple costly platforms for 2.5G and 3G SGSNs, GGSNs, and in the future even an S4 SGSN? Is your existing SGSN optimized for GPRS or UMTS without consideration for the evolution to HSPA, HSPA+, and EPC? Do you want more flexible deployment options not limited by the choice of platform?
Mobile subscribers have increasingly high expectations for immediate access to Internet-based services and applications through a mobile broadband connection. This requires mobile operators to build their packet core networks to handle increased traffic, usage, and subscriber growth. Have you looked at attaches, detaches, and mobility management on your existing SGSN as your 3G network grows and migrates to 4G?

The Starent SGSN Difference
Starent’s ST40, which is now the Cisco ASR 5000, is purpose-built to address the needs of mobile packet core networks. Beginning with activation, Starent’s SGSN identifies and authenticates the subscriber and routes their session to the GGSN within the core network. It can then be routed to any end point, like the Internet or any operator service. Starent’s SGSN also manages subscriber mobility and maintains subscriber information, ensuring a seamless experience as a subscriber roams. Starent’s SGSN accommodates a high rate of simultaneous attaches and detaches, making it the ideal solution for networks with high packet traffic and a significant subscriber base. In order to optimize the entire signaling chain, the SGSN’s design eliminates or minimizes bottlenecks caused by large scale control signaling.

Key Features and Benefits
- Industry leading performance including capacity, throughput, and session and mobility management
- Full UTRAN/GERAN to core network access support includes mobility management, GTP tunneling and de-tunneling, and PDP context activation and management, as well as attaches/detaches and billing
- Optional support for Direct Tunnel and Starent’s FastPath architecture to improve the subscriber experience and reduce operational and capital expenditures by optimizing the usage of subscriber plane resources
- Increased flexibility by enabling the combination of 2.5G and 3G SGSNs on a single platform
- SGSN can be combined with GGSN or EPC elements such as MME and SGW on a single platform to maximize efficiency and flexibility, reduce latency, and simplify and optimize network architecture
- Frame Relay, ATM, and IP-based transport on all radio and core network interfaces enhances performance, offers outstanding scalability, and reduces inter-connectivity complexity

Network Flexibility and Efficiency
Network efficiency and operational simplicity can be increased by combining the SGSN with Starent’s Gateway GPRS Support Node (GGSN) on the same ST40, now the Cisco ASR 5000. The platform is capable of handling the SGSN’s state-heavy characteristics and GGSN’s processing intensive characteristics within a single system through the optimal use of common hardware, memory, and CPU resources.

The Starent SGSN’s ability to support 2.5G and 3G services in the same chassis results in operational optimizations and efficiencies, as well as cost savings. Since the SGSN handles 2.5G and 3G procedures in the same processes, there is a reduction in the number of IP addresses required, as both services appear as a single SGSN service and use common uplinks. In addition, there are no internal software interfaces between processes during 2.5G/3G hand-offs. In this way, the Starent SGSN avoids repeated exchanges with the Home Location Registry (HLR) to retrieve the same subscriber state.
Knowing that you'll be operating a blended network for years to come, it might be comforting to know that the SGSN can be upgraded to or integrated with Release 8 SGSN or even other EPC elements, such as a Mobility Management Entity, via a simple software download.

**Direct Tunnel and FastPath Support**
Starent's SGSN makes use of the Direct Tunnel architecture, which enables the SGSN to establish a direct subscriber plane tunnel between the radio access network (RAN) and the GGSN. In addition, Starent also supports FastPath, which frees up the SGSN to perform other high touch services and signaling procedures. With FastPath, no change is required to your architecture as the SGSN discerns no difference between home and roaming users, meaning no new procedures need to be performed.

**Location Management**
The SGSN supports outstanding scalability of standards-based routing area updates (RAUs) for location management, including periodic RAUs, intra-SGSN RAUs, and inter-SGSN RAUs. Further, the SGSN's high capacity and flex functionality provide a great opportunity to convert high impact inter-SGSN RAUs to lower impact intra-SGSN RAUs.

**Session Management**
Starent's SGSN performs comprehensive session management, including context activation, modification, deactivation, and preservation. It also provides support for IPv4, IPv6, and PPP PDP context types. In addition, the SGSN's intelligent PDP context preservation feature facilitates efficient radio resource utilization.

**Charging**
The SGSN supplies standards-based SGSN Call Detail Records (S-CDRs) and Mobility Call Detail Records (M-CDRs). Further, Starent's SGSN implements the standardized Ga interface for the exchange of charging data with one or more configured Charging Gateways (CGF).
CONCLUSIONS

Starent’s SGSN on its robust ST40, which is now the Cisco ASR 5000, provides comprehensive, high capacity, and standards-compliant GSM/GPRS, EDGE, UMTS, and HSPA network access. With the Starent SGSN, you can minimize capital and operational costs, ease deployment of revenue generating services, and improve the reliability of your network, making your network more robust and improving your competitive differentiation.