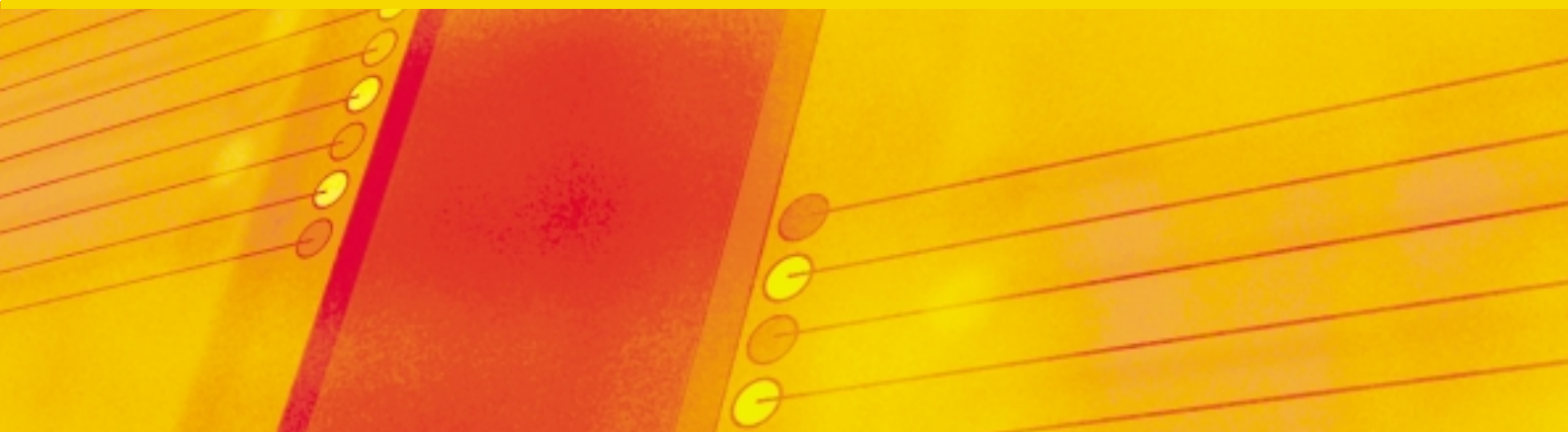




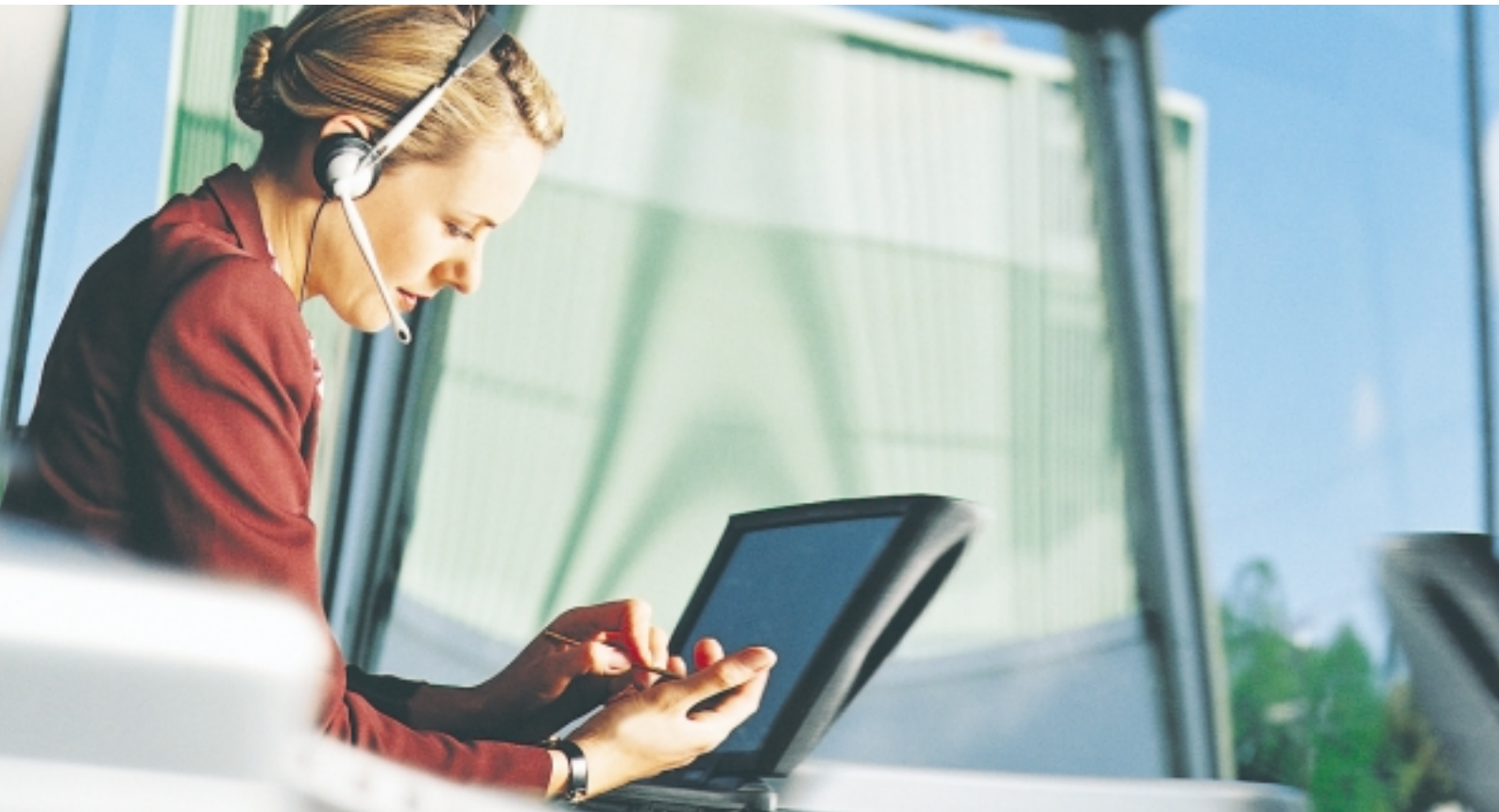
Alcatel 5070 SSG
Signaling Server Global
(ANSI Version)



ARCHITECTS OF AN INTERNET WORLD



The Alcatel 5070 Signaling Server Global (SSG) ANSI is an extremely versatile, high-capacity signaling platform. It gives carriers and service providers alike the ability to make their networks more efficient and capable of deploying revenue-generating services.



OPENING UP REVENUE-GENERATING SERVICES

Designed as a full-featured high-speed packet switch, the Alcatel 5070 SSG ANSI receives, routes and transmits signaling messages for call setup, wireless and intelligent network (IN) services.

The Alcatel 5070 SSG ANSI is a powerful, compact system combining traditional signaling transfer point (STP) functionality with advanced routing functions, to support the expanding Number Portability and wireless markets. In addition, the product provides increased levels of connectivity, capacity and expandability over previous products, making it a true next-generation STP. It is feature rich, with traditional SS7 features on a platform that also supports large-capacity services databases. The Alcatel 5070 SSG ANSI is not only a great fit in a legacy circuit-based network, but also delivers the capacity and interfaces to support the signaling gateway requirements of voice-over-packet (VoP) and 3G networks.

With Release 20, the Alcatel 5070 SSG ANSI introduces a rich set of applications to support Mobile Number Portability and Wireless Number Portability, as well as features to help manage multiple home location registers (HLRs), short message service centers (SMSCs) and voice mail systems (VMSs).

Implementing federally mandated Local and Wireless Number Portability, as well as other IN applications, means increased demands on signaling network capacity. The Alcatel 5070 SSG ANSI reduces the impact of high network transaction services by supporting High-Speed, 1.536-Mb/s ATM-over-T1 (ATM/T1) Links, and high-capacity virtual SS7 over IP (SS7/IP) Links. These two forms of High-Speed Links offer connectivity with fewer transmission facilities; reduce signaling latency for faster signaling response time; and provide higher message capacity, overcoming signaling link set limitations. Providers have these network benefits without sacrificing SS7 connectivity and signaling.



FEATURES

The Alcatel 5070 SSG ANSI serves as a transport system to provide reliable transfer of Message Signal Units (MSUs) between network locations and across network fabric transitions. With the flexibility of this product, carriers can address expanded capacity and connectivity needs, continue to offer a wide variety of applications in the SS7 network, and bridge directly to packet networks.

High Capacity

To support basic functions such as Message Transfer Part (MTP), Signaling Connection Control Part (SCCP), and the signaling gateway function, the Alcatel 5070 SSG ANSI offers the following features and services.

IP Signaling Links

IP signaling links, or IPVHSLs, allow the Alcatel 5070 SSG ANSI to act as the signaling gateway between SS7-based and IP-based packet networks. High capacity IPVHSLs support growing call

handling volume between the SS7-based networks and IP-based networks where the message capacity exceeds that of SS7 link sets. The Alcatel 5070 SSG ANSI provides an IP signaling link that replaces many SS7 links.

Gateway Screening is available on the SS7 side of the interface to protect the IP network from unauthorized access by SS7 network elements. IPVHSLs also provide an alternative form of high-speed link connectivity within SS7 networks to support high capacity B, C and D links between STP nodes, as well as A links to service control points and HLRs.

The Alcatel 5070 SSG ANSI includes SS7-IP protocols as defined by the Internet Engineering Task Force (IETF) SIGTRAN working group. The base protocol layer is SCTP, with multiple adaptation layers such as M2PA, M3UA, SUA and M2UA, depending on the network application. The initial adaptation layer implemented is M2PA.

ATM/T1 High-Speed Links

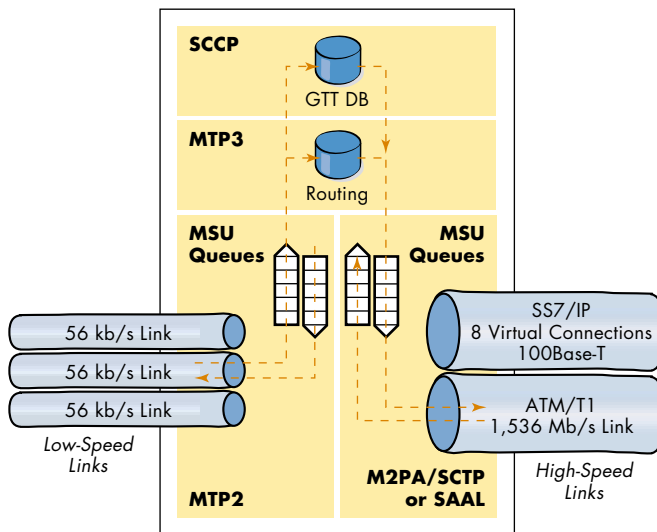
Intelligent network applications require increasing network capacity. By supporting High-Speed Links (HSLs), as shown in Figure 1, the Alcatel 5070 SSG ANSI provides connectivity with fewer transmission facilities, reduces signaling latency for faster signaling response time, and delivers higher message capacity, overcoming signaling link-set limitations. The Alcatel 5070 SSG ANSI gives providers these network benefits without sacrificing SS7 connectivity and signaling.

T1 cards support signaling ATM adaptation layer (SAAL) for transport of ATM messages to MTP layers (MTP2 and MTP3) of the SS7 protocol, as shown in Figure 1.

Flexible Routing

Flexible Routing is Alcatel's patented message detection and routing framework for the Alcatel 5070 SSG ANSI. Within this framework, the Alcatel 5070 SSG ANSI can perform numerous type of applications, such as Number Portability or Application Location Register (ALR).

Figure 1 - Alcatel 5070 SSG High-Speed Link Capability



Number Portability is a key issue for competition in the telecom industry.

A powerful component of the Alcatel 5070 SSG ANSI's database capabilities is its high transaction rate capability.

The Alcatel 5070 SSG ANSI supports up to 50 million database entries, allowing for multiple co-resident databases to be hosted on the same platform. This means that a service provider can support an entire national Local Number Portability (LNP) database on a single Alcatel 5070 SSG ANSI or can support multiple ALR database types on the same Alcatel 5070 SSG ANSI.

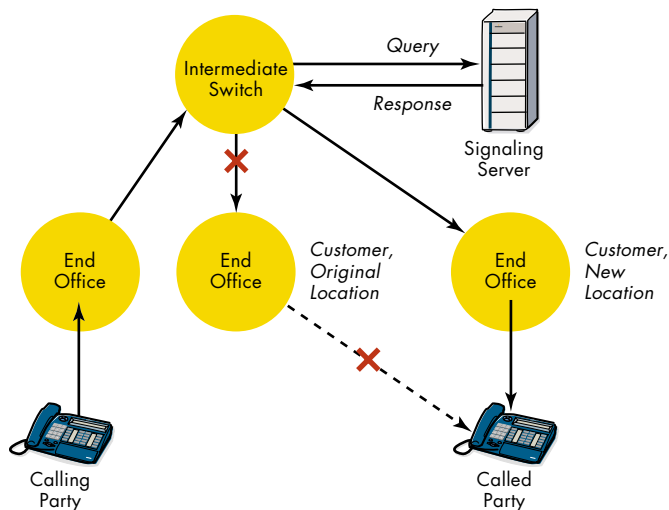
The Alcatel 5070 SSG ANSI uses high performance database cards capable of supporting up to 2,500 transactions per second per card. The transactions can be run in parallel, for a total of more than 160,000 transactions per second.

Number Portability

Due to the deregulation of the telecommunications market, mandated Number Portability (NP) is a key issue for competition in the telecommunications industry. The Alcatel 5070 SSG ANSI combines its traditional capabilities of message transport and control with an NP solution, providing the NP network database and service logic to support ported number translations. Since the NP functionality is integrated within the Alcatel 5070 SSG ANSI, service providers have quick and efficient call routing with lower implementation costs — because the queries are handled locally rather than in a separate network node.

The Alcatel 5070 SSG ANSI gives operators the ability to deploy unrestricted network intelligence, maintaining independence from switching equipment. Figure 2 illustrates the NP application.

Figure 2 - Number Portability



Number Pooling

Local exchange carriers require a central office (CO) code per rate center. As a result, there is an increasing incidence of CO code exhaustion requiring the associated numbering plan area (NPA) splits and overlays. Currently, the CO codes, NPA-NXX, are assigned to carriers at the 10,000-block level. At this level, the telephone number utilization tends to be inefficient in sparsely populated rate centers or in switches that do not have many subscribers. As a result, area codes are split even though numbers remain unused. The goal of Number Pooling is to promote better number utilization, thereby avoiding additional area code splits. Number Pooling addresses this use by using 1000-block-level Number Pooling to avoid NPA splits.

The Number Pooling feature provides for the assignment of numbers in blocks of 1,000. These 1,000 numbers are considered pooled. The owner of the 1,000 number block is called

the block holder, and the owner of the NPA-NXX is called the code holder. A code holder surrenders unused blocks to the pool, which may then be assigned to another service provider. The service provider owning the block assigns a location routing number (LRN) for all numbers within that block. The LRN is used to route the call to the service provider (destination). Any number within a pooled block can port to another service provider. Therefore, any given 10-digit telephone number can be ported, pooled, both ported and pooled, or neither ported nor pooled.

Table 1 shows some examples of ALR routing.

Table 1 - Types of ALR

Type of ALR	Used for
ALR for HLRs	HLR routing
ALR for SMSCs	SMSC routing
ALR for VMSs	VMS routing

ALR routing locates and routes customer service queries, facilitating communication across the network to all wireless service nodes.



Gateway Screening helps preserve network integrity by preventing unauthorized access.

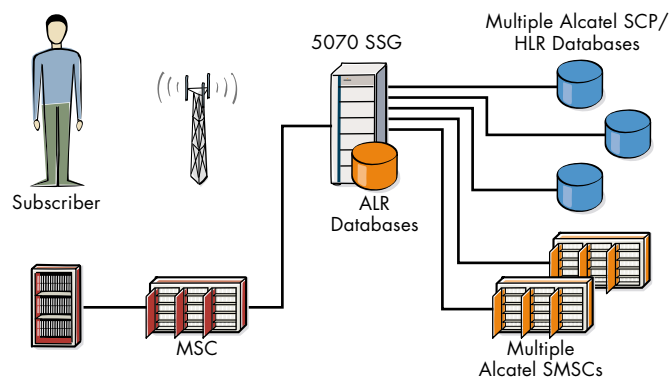
The Number Pooling feature provides the functional capability to support 1,000-block Number Pooling in the LRN and Global Title Translation (GTT) databases with a routing functionality similar to LNP. To route a call, the originating switch launches an LRN query to obtain the LRN of the called number. The Alcatel 5070 SSG ANSI must determine the LRN, which may require two database lookups: one to determine if a number is ported, and if it is not ported, another to determine if it is pooled.

Application Location Register

In today's environment, wireless service providers must pace network growth with an increasing number of subscribers and complex services. The Alcatel 5070 SSG ANSI features Application Location Register (ALR) routing, shown in Figure 3, to allow a more efficient usage of multiple HLRs, SMSCs and voicemail/unified messaging systems.

With ALR routing, the Alcatel 5070 SSG ANSI locates and routes customer service queries to the proper network node, facilitating

Figure 3 - ALR Routing



communication across the network to all wireless service nodes. ALR for HLRs supports a significantly better usage of HLR capacity and allows a separation of the mobile identification number (MIN) from the mobile directory number (MDN). In addition, with ALR for SMSCs and ALR for VMSs, the Alcatel 5070 SSG ANSI can provide Flexible Routing to SMSCs and voice mail/unified messaging systems, respectively. This enables new services on dedicated nodes for a particular group of subscribers.

ALR routing uses a specialized database, coupled with software to decode fields in the SCCP and

TCAP portions of the signaling message, to identify the subscriber and translate the network address of the node handling a subscriber's service, such as the HLR. ALR routing enables the Alcatel 5070 SSG ANSI to respond to queries for updating subscriber location, sending routing information or forwarding short messages. The ALR implementation supports IS-41 as well as GSM-based networks.

An interface to external provisioning systems handles transactions for activating subscriber records and establishing HLR, SMSC and other subscriber routing information.



Global Title Translation

Intelligent networks and wireless switching systems often do not perform Global Title Translation (GTT) efficiently. When services such as enhanced 800/900, virtual private networks and HLRs are triggered, the switches suspend call processing and launch a query into the network toward the adjacent STP. The message contains address information that determines the GTT to be performed. When services are distributed across multiple service control points or HLRs, GTT provides efficient routing and redundancy. Keeping the GTT information in a central pair of STPs supports efficient and flexible operation of the network. The Alcatel 5070 SSG ANSI provides the powerful, real-time processing necessary to meet these GTT requirements.

Gateway Screening

The Alcatel 5070 SSG ANSI acts as a gateway for messages transferred between networks.

Increasing competition and globalization of the telecommunications market prompted requirements for monitoring, measuring and controlling access between SS7 networks. Consequently, the Alcatel 5070 SSG ANSI Gateway Screening feature has become increasingly important to ensure network security.

The Gateway Screening feature allows for message traffic based on commercial agreements. This feature provides operators with the ability to protect against unauthorized traffic between networks, to protect against malicious and unauthorized access to the network, and to collect measurements on traffic screening results. The Alcatel 5070 SSG ANSI provides the ability to screen messages as they are received.

Gateway Screening prevents unauthorized access to databases and prevents use of unleased facilities and services. In the screening process, the MTP and SCCP parts of the message are



examined to determine if the message can be processed. Gateway Screening enables a network management mechanism to prevent unauthorized access, and thus protects network integrity.

Multiple Originating Point Code

The Alcatel 5070 SSG ANSI supports Multiple Originating Point Code definitions, which allow link sets to have a different adjacent point code definition than the main STP point code. This flexibility allows for ease of installation into networks in which the Alcatel 5070 SSG ANSI is replacing previously installed STP systems, and in cases where network signaling is being consolidated to a smaller set of STP systems to provide economic savings in operations and maintenance.

This functionality allows introduction or consolidation of new STP systems into the network without impact to subtending and interconnected network elements. Rather than

having to change destination point codes and adjacent node point codes, subtending and interconnected elements retain their routing definitions, while the new system is introduced into the network via facility switchovers.

OSS Interfaces

The Alcatel 5070 SSG ANSI provides interfaces to Telcordia operations support systems (OSSs) for SS7 routing provisioning, LNP provisioning, data collection and monitoring. The system includes functionality based on GR-310 and GR-778 for interface to the Telcordia Signaling Network Activation Manager and the Telcordia Network Performance Manager. Also, a CMISE interface for LNP provisioning either to the Signaling Network Activation Manager or to an LSMS is provided per SR-4384. In addition to monitoring capability, the system provides a serial logging channel interface for delivery of alarm and user interface command information.



WHY ALCATEL?

Alcatel is the STP vendor of choice for major networks. The Alcatel 5070 SSG ANSI is a natural progression to next generation signaling services, offering customers all of the SS7 features currently available on existing STPs. This allows customers with existing STP networks to augment or migrate seamlessly to the Alcatel 5070 SSG ANSI with SS7/IP signaling gateway functionality while providing transparent, legacy STP services.

The Alcatel 5070 SSG ANSI can be deployed in many network scenarios.

Capacity

Many customers with networks of legacy STPs have reached link connectivity and capacity limits. The Alcatel INFusion STP A, which the

Alcatel 5070 SSG ANSI replaces, supports a maximum of 720 DS0 links and 14 million database entries.

The Alcatel 5070 SSG ANSI is the only product on the market that supports a link count with growth to the multi-thousand range with the throughput capacity to support these link quantities without performance degradation. For those with existing Alcatel INFusion STP products, the evolution scenario allows retention of investment in existing plant while expanding into the next generation realm. And with support for 50 million database entries and transaction rates starting at 2,500 transactions per second, the Alcatel 5070 SSG ANSI provides significantly higher database capacity than the previous generation Alcatel INFusion STP A.



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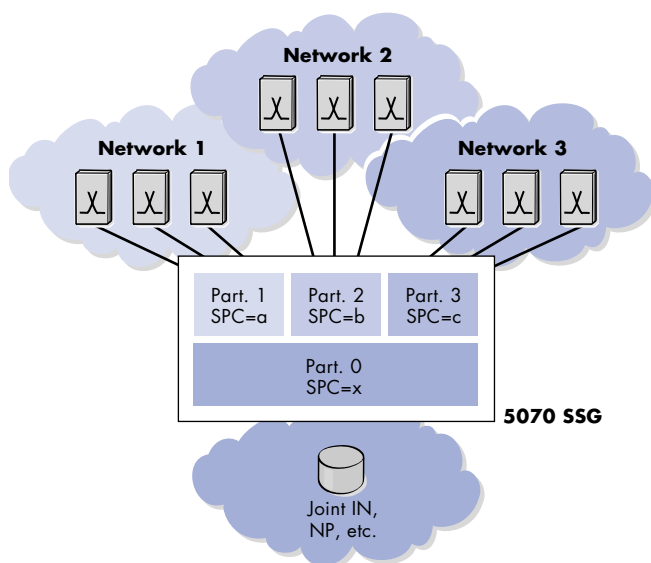
Packet Overlay Network Consolidation

Customers interested in operational and/or STP consolidation cost reductions from their legacy STP networks can utilize the greater capacity of the Alcatel 5070 SSG ANSI to fold multiple existing STPs into a single platform. Public switched telephone network (PSTN) circuit-based networks designed six to ten years ago typically located STPs in geographic regions based on carrier transport costs at the time. Carrier transport costs have been declining for several years, eliminating the cost-effectiveness of having many small STPs, each requiring maintenance and yearly software/hardware upgrades. As shown in Figure 4, the Alcatel 5070 SSG ANSI can easily

support very large numbers of links with unequaled reliability and capacity to facilitate consolidation.

Many customers with existing circuit-based networks are planning to implement overlay VoP networks. These customers will require additional SS7 link connectivity and capacity from their legacy STPs to support the new overlay VoP networks. Most legacy STP networks will not have the available capacity or connectivity to support both a circuit-based and a VoP network. The hardware costs alone to upgrade legacy STPs to support an additional overlay network will make the Alcatel 5070 SSG ANSI a cost-effective alternative.

Figure 4 - MOPC Network Consolidation



In Figure 5,

- > IP provides:
 - Low-cost packet transport
 - High-capacity broadband transport
 - High-Speed SS7 Virtual Links
- > SS7 provides:
 - Network control
 - Connection management
 - Reliable real-time delivery
 - Network status/link state

The Alcatel 5070 SSG ANSI provides:

- > Flexible Routing to network elements
- > Interworking between the SS7 network and IP network elements
- > Support for revenue generating enhanced services

Figure 6 shows the Alcatel 5070 SSG ANSI in a packet network.

Figure 5 - Alcatel 5070 SSG with SS7 and SS7/IP Connections

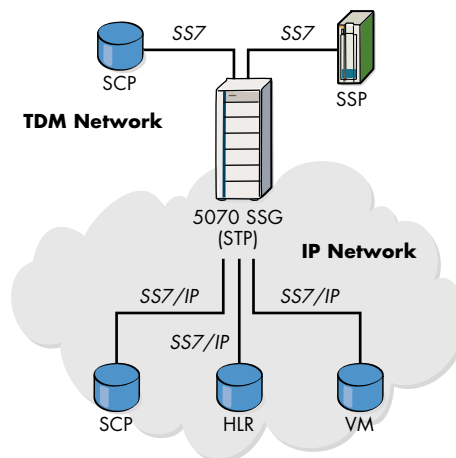
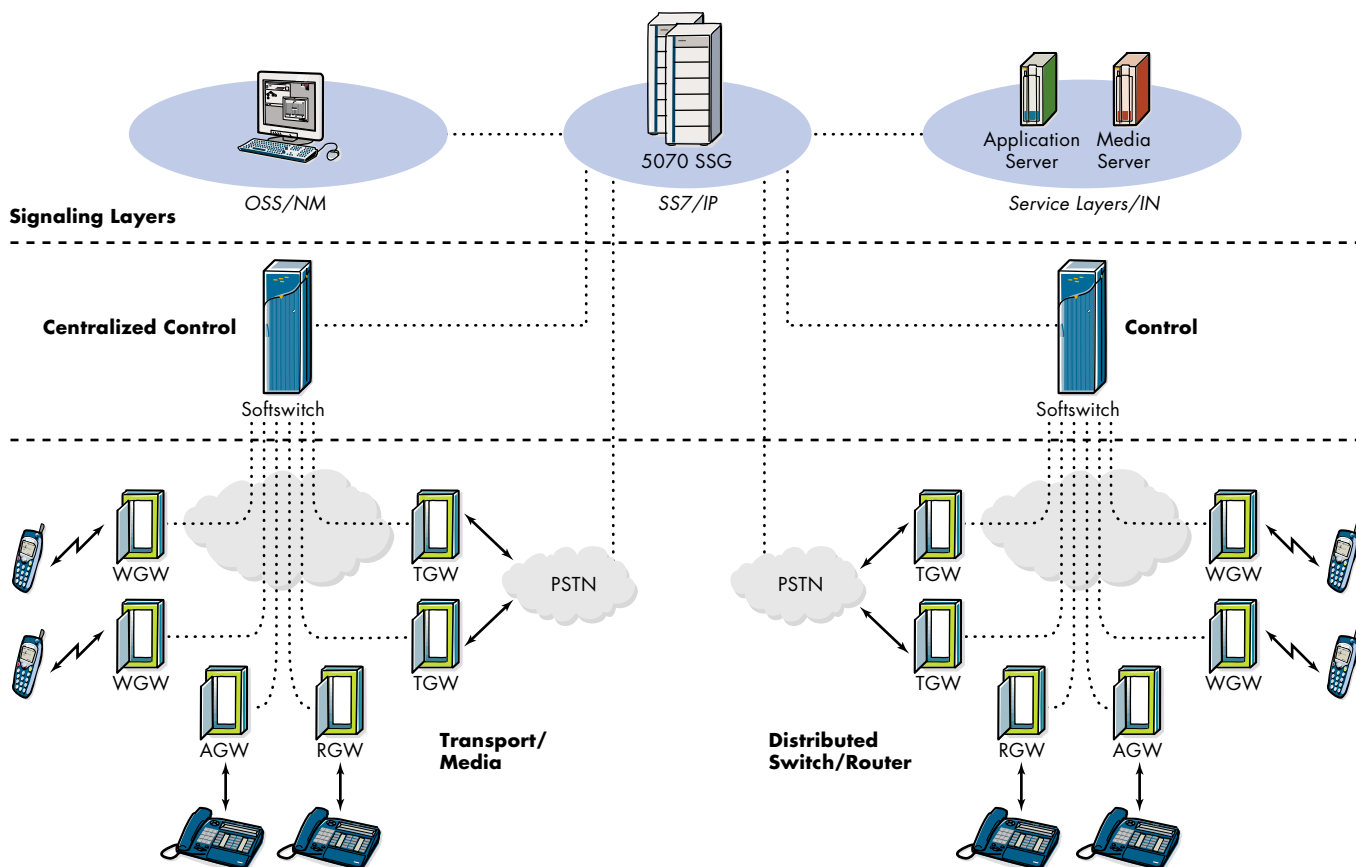


Figure 6 - Alcatel 5070 SSG in the Packet Network



A GOOD FIT

The Alcatel 5070 SSG ANSI is a good fit for a variety of service provider types.

Incumbent Local Exchange Carriers

ILECs can use the Alcatel 5070 SSG ANSI to consolidate their existing STP infrastructure, thereby minimizing maintenance and operational overhead. The Alcatel 5070 SSG ANSI can also be used to provide signaling services for ILECs moving towards converged networks. Its flexible interfaces allow ILECs to provide signaling services for data, voice or converged networks.

Competitive Local Exchange Carriers

CLECs can deploy a pair of Alcatel 5070 SSG ANSIs to offer SS7 services in new markets at minimal cost. The Alcatel 5070 SSG ANSI is extremely cost-effective, as well as scalable, so it is the perfect signaling solution for CLECs. Flexible interfaces allow CLECs to provide signaling services for data, voice or converged networks for their own use or to provide these services for other carriers.

Long Distance Carriers (LDCs) — CLDC and XLC LDCs can use the Alcatel 5070 SSG ANSI either to consolidate their STP networks or to enter new markets. The Alcatel 5070 SSG ANSI can also be used to provide signaling services for LDCs moving towards converged networks. Flexible interfaces allow LDCs to provide signaling services for data, voice or converged networks.

Smaller Carriers

Smaller service providers benefit from the Alcatel 5070 SSG ANSI's ability to host a number of database applications and a large number of links in a single frame configuration.

Wireless Carriers

Wireless carriers can use the Alcatel 5070 SSG ANSI to provide wireless world roaming with next generation technologies. Alcatel's comprehensive ALR implementation provides wireless carriers a tool for flexible and efficient network operation, covering HLRs, SMSCs and voice mail/unified messaging systems.



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