



Signaling Solutions for International Roaming

The Syniverse Signaling Solutions for International Roaming function as an ANSI-41 call processor that provides interoperability among the various revisions of the TIA/EIA ANSI-41 signaling family and seamless translation of international roaming protocols.

To solve switch, signaling, routing and numbering problems associated with international roaming, and to enable network elements in one country to route messages to other countries without the need for indirect routing in either the home or serving network, Syniverse **Signaling Solutions** provide the industry-unique, comprehensive signaling interoperability technologies today's operators need for international roaming.

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Benefits of Signaling Solutions

- Eliminate complex international roaming setup requirements.
- Enable seamless international roaming call and service delivery.
- Streamline network and switching operations and testing.
- Reduce serving market operations requirements.

Features of Signaling Solutions

The Syniverse Signaling Solutions resolve a wide variety of interoperability difficulties, including:

Management of Multiple MIN Ranges and Point Codes

All MIN ranges and point codes are directed to a single point code through Syniverse's centralized call processor, which resolves problems associated with MIN and point code overlap.

System Identifier (SID) Mapping

System identifier (SID) codes can present numbering conflicts between countries. Wireless systems use five-digit SID codes to uniquely identify each operator's network and market. Operators use codes designated by their national telecommunications authority within the range specified for their country. Since international coordination of SID assignments is relatively recent, some SIDs are in use by operators in more than one country. An operator with a large base of embedded non-IFAST SIDs must either find a solution to potential SID conflict issues or consider reprogramming handsets. The Syniverse Signaling Solutions solve the SID conflict problem – when ANSI-41 signaling messages are routed through our call processor, the in-country SID is mapped to an IFAST SID.

International TLDN – Automatic Call Delivery

Due to the variety of telephone numbering schemes throughout the world, countries have adopted different dialing methods to place international calls. The format of



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international numbers varies among countries and switches. For example, a wireless subscriber in a European country might have to dial "44" before placing an international call; a wireless subscriber in North America may have to dial "011-44." Within IS-41 call delivery, a home cellular switch must be able to receive international dialing strings from the serving switch and append the international outbound code for the particular home country. Some switches using ANSI-41 standards are unable to determine if a temporary location directory number (TLDN) received from a serving switch is formatted as a national or international number. This renders the switch helpless to determine how to use the received TLDN to deliver a call to a subscriber roaming internationally. Syniverse's centralized call processor determines the necessary manipulation of the received TLDN to build a digit stream that routes the call between the specific international locations.

ANSI SS7-to-ITU C7 Signaling Interoperability

Often referred to as C7 and SS7, these network types require protocol conversion in order to support ANSI-41 messages that enable international roaming. Syniverse's centralized call processor's ANSI/ITU-T signaling interoperability provides a gateway between ANSI- and ITU-based signaling networks.

TIA/EIA Protocol Interoperability

Syniverse provides roaming interoperability between markets that use different revisions of the TIA/EIA protocol by providing interoperability between ANSI Rev. C markets and markets using IS-41 Rev. A and Rev. B. You can choose roaming partners based on market coverage need, allowing subscribers to experience seamless roaming regardless of the ANSI-41 revision level.

Switch Type Incompatibility

Despite efforts made by switch vendors to ensure final published versions of signaling and other standards clearly and accurately represent the requirements for network compatibility, operators still must deal with significant interoperability issues. Using the Syniverse Signaling Solutions, you work directly with Syniverse rather than with multiple switch vendors to identify and resolve these issues with roaming partners.

Short Message Service (SMS) Routing

Subscriber demand for SMS while roaming continues to increase. Unfortunately, delivery has been limited by multiple addressing parameters, interworking issues and variations in network standards, including the use of ITU and ANSI point codes on different networks. Using sophisticated addressing and routing technologies, the Syniverse Signaling Solutions deliver and terminate SMS messages regardless of the message destination.

International SMS Rating and CIBER Creation

Some roaming partners (serve) do not create CIBER records for international SMS messages (MO and MT), preventing home operators (Syniverse Signaling Solutions customers) from being able to bill their subscribers a specific retail rate for these messages.



International SMS Rating and CIBER Creation is an optional service in which Syniverse provides its customers rated CIBER 22 call detail records for its incollect CDMA international SMS messages. Syniverse extracts data from the customer's SMDPP messages traversing Syniverse's Rev C call processor, rates the messages according to the customer's specifications and creates CIBER 22 incollect records.

Users of this service must also be Syniverse ACCESS® Clearing and Settlement Service customers.

Welcome SMS Service for CDMA Operators

This service allows the home operator to automatically welcome its subscribers with an SMS text message(s) when they reach their roaming destination. You simply provide the message content and Syniverse handles the rest. You also can give subscribers general roaming instructions or clarify how to make international calls while roaming. Features include:

- Recognition of whether the message needs to be generated upon registration by the subscriber.
- Content tailored to the roaming location (e.g., tourist information targeted to the roaming city).
- Language flexibility – you designate the language of choice for the message (some restrictions may apply, depending on character set).
- Adequate message capacity to provide subscribers with the right amount of information (message size limit is 160 bytes).
- Operator-defined parameters to ensure subscriber does not receive duplicate messages.

WIN Routing Service

Many CDMA operators offer their subscribers services based on the Wireless Intelligent Network (WIN) IS-826 standard. WIN Routing Service supports the routing and processing of WIN-based IS-826 messaging. This Signaling Solutions feature enables services such as international CDMA prepaid roaming between a home operator's IS-826 WIN-based prepaid platform (SCP) and IS-826-compliant markets. The service supports both CDMA voice and SMS text messaging. WIN Routing Service also will route the messaging required for generating "tones" from a serve market switch (MSC) that can be used to notify prepaid subscribers of their low balance.

Roaming Partner Control

Unbillable roaming occurs when a serving operator inadvertently provides services to a roamer whose home operator does not have a roaming agreement in place with the serving operator. The resulting roaming activity cannot be billed back to the subscriber,



About Syniverse

Serving more than 900 mobile operators, cable and Internet providers, and enterprises in over 160 countries, Syniverse offers market-leading solutions that simplify the complexities of roaming, messaging, network interoperability and business intelligence for mobile operators, MSOs, enterprise verticals and emerging mobile providers.

leading to revenue loss for the serving operator. Roaming partner control helps operators prevent this type of unbillable roaming from occurring in their networks by allowing operators to automatically restrict a roamer's call delivery, call origination and SMS messaging. The tool ensures operators only enable services for paying roamers, helping stop roamers from using services for free.

Operator-Level Identity for SMS

Many operators see the potential value in billing their subscribers different SMS rates based on the subscriber's roaming location. But until now, location-based billing has been both costly and resource intensive. Operator-level identity for SMS gives operators a simple, cost-effective method for location-based SMS billing that can increase messaging revenue. Instead of having to maintain a database of hundreds of roaming partners' switches, operators can use a table of unique predetermined (virtual) MSCID values created and maintained by Syniverse to route messaging through the Signaling Solutions call processor platform.

Additional Features

SS7 Test Simplification

Wireless operators need only to connect to and test with the Syniverse call processor on initial implementation.

Enhanced Customer Service and Troubleshooting

Customer service is provided by a knowledgeable Syniverse representative with the necessary language skills to communicate and resolve issues quickly.

Enhanced Network Monitoring

The Syniverse network operations center monitors network problems or signaling errors 24 hours a day, seven days a week, and communicates with operators via fax, pager or email.

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