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3RD GENERATION
PARTNERSHIP
PROJECT 2
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ANS/SS7 Transport Signaling Protocols

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Revision History

Revision	Initial Publication	Date
Rev. 0	Initial Publication	March 2004

PART 511

1 MESSAGE TRANSFER PART

The MTP is defined in *ANSI T1.111*, with the following supplemental information.

The MAP messages that are transported on an intersystem basis may be assigned a message priority value of either 0 or 1. The INVOKE, RETURN RESULT, RETURN ERROR, and REJECT components associated with the same operation (e.g., FacilitiesDirective) shall have the same message priority value. The operations with message priority value 1 are listed below. All others have message priority value 0.

Table 1 TIA-41 Operations having MTP Message Priority Value 1

<i>TIA-41</i> Operation
FacilitiesDirective2
FacilitiesDirective
FacilitiesRelease
HandoffBack2
HandoffBack
HandoffToThird
HandoffToThird2
InterSystemAnswer (see note a)
MobileOnChannel
RedirectionDirective
RedirectionRequest
TransferToNumberRequest

Notes:

- a. The MTP Message Priority value for the InterSystemAnswer has changed in rev. E

The message priority value may be determined by the *TIA-41* MAP based on the message type and may be passed down to the MTP through the SCCP. In the case when a REJECT component is to be returned, the message priority of the REJECT component should be the same as that of the rejected message.

2 SIGNALING CONNECTION CONTROL PART

For *TIA-41* applications, the SCCP is defined in *ANSI T1.112*, with the following exceptions and limitations:

- SCCP Class 0 connectionless service is requested from the SCCP. (However, in accordance with SCCP procedures, if a *TIA-41* message is segmented by the SCCP, the sequence of XUDT messages carrying the segments are sent using SCCP Class 1 sequenced connectionless service. The In-Sequence Delivery Option field of the segmentation parameter within each of the XUDT messages is set to 0 to reflect the original request for Class 0 service.)
- Whether to set the *return message on error* or *discard message on error* option in the Protocol Class parameter of the UDT or XUDT message is at the discretion of the implementation. If *return message on error* is requested by the SCCP user for a segmented message, then only the first XUDT message sent shall have *return message on error* requested.
- The *TIA-41* Mobile Application Part has assigned the following Subsystem Numbers (SSN). Use of the following SSN values is recommended¹:
 - 5: Mobile Application Part (MAP)
 - 6: Home Location Register (HLR)
 - 7: Visitor Location Register (VLR)
 - 8: Mobile Switching Center (MSC)
 - 9: Equipment Identification Register (EIR) (reserved)²
 - 10: Authentication Center (AC)
 - 11: Short Message Service (SMS)
 - 12: Over-The-Air Service Provisioning Function (OTAF)
- In accordance with *ANSI T1.112* an SSN shall be included in all messages even if message routing is based on Global Title Translation (GTT). The null SSN (i.e., value 0) should be used when the subsystem is not known (e.g., before a global title translation takes place) per *ANSI T1.112*.
- Global title addresses are required in the SCCP Called Party Address and the SCCP Calling Party Address for international roaming purposes.

¹ Further SSN assignments are not planned.

² Detailed transactions relative to SSN value 9 are for further study.

- Global Title Translation on Mobile Identification Number can be used for communication with the HLR on the ANSI SS7 network¹. The following encoding may be used:

Table 2 ANSI SS7 - MIN to HLR Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	3 (00000011 ₂) "Cellular Nationwide Roaming Service"
	Address Information	<i>MIN</i>

¹ An administrative set of SS7 nodes that are interconnected by a common national signaling point code addressing scheme.

- Global Title Translation on Mobile Identification Number can be used for communication with a Message Center on the ANSI SS7 network. The following encoding may be used:

Table 3 ANSI SS7 - MIN to MC Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	12 (00001100 ₂) "Wireless MIN-Based Short Message Service"
	Address Information	<i>MIN</i>

- Global Title Translation on IMSI (ITU-T E.212 International Mobile Subscriber Identity) can be used for communication from a Serving System (MSC or VLR) to an HLR on the same or a different national SS7 network using the IMSI of a roaming mobile. It may also be used for communication to any network element that is identified by an E.212 formatted address on the same or a different SS7 network. The following encoding may be used:

Table 4 ANSI SS7 - E.212 Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	16 (00010000 ₂) Cellular/PCS Interworking (see note a)
	Address Information	<i>IMSI or other E.212 formatted address</i>

Notes:

- Translation Type 9 may be used in some networks based on the initial IS-807 recommendation.

- Global Title Translation on an E.164 number (e.g., Mobile Directory Number) can be used for communication to an HLR on the same or a different national SS7 network based on the Mobile Directory Number. The following encoding may be used:

Table 5 ANSI SS7 - MDN to HLR (E.164) Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	14 (00001110 ₂) "Mobile Subscriber Addressing"
	Address Information	<i>E.164 Mobile Directory Number</i>

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- Global Title Translation on an E.164 number (e.g., Mobile Directory Number) can be used for communication to an MC on the same or a different national SS7 network based on the Mobile Directory Number. The following encoding may be used:

Table 6 ANSI SS7 - MDN to MC (E.164) Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	17 (00010001 ₂) "Mobile Subscriber Message Center Addressing"
	Address Information	E.164 Mobile Directory Number

- Global Title Translation on IMSI can be used for communication from a Serving System (MSC or VLR) to a Message Center on the same or a different national SS7 network. The following encoding may be used:

Table 7 ANSI SS7 - IMSI to MC Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	13 (00001101 ₂) "Wireless IMSI-based Short Message Service"
	Address Information	<i>IMSI</i>

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- Global Title Translation on portable Directory Number can be used for communication with the NPDB. The following encoding may be used:

Table 8 ANSI SS7 - DN to NPDB Global Title

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	11 (00001011 ₂) "Internetwork Number Portability Query/Response"
	Address Information	<i>E.164 Directory Number</i>

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- Global Title Translation can be used for communication with a Service Control Point (SCP). The following encoding may be used:

Table 9 ANSI SS7 - SCP Global Title Addressing

Field	Sub-field	Value
Address Indicator	SSN Indicator	1
	Point Code Indicator	0 or 1
	Global Title Indicator	2 (0010 ₂)
	Routing Indicator	0
	National or International Indicator	1 (National use)
Subsystem Number		<i>Include applicable value if known or zero.</i>
Global Title	Translation Type	8 (00001000 ₂) "SCP assisted call processing application"
	Address Information	<i>Ten-digit global title address, with the first 6 digits being the Location specific part (consists of Network ID and Cluster ID of the destination STP) and the last 4 digits being the application specific part (identifies the destination SCP and application).</i>

- When an originating network entity sends an SS7 message within a national SS7 signaling network with a global title in the SCCP calling party address field, the SCCP calling party address field should include the point code and subsystem number of the originating network entity. Note that a Signaling Transfer Point (STP) is considered to be an intermediate network entity, not an originating network entity.
- When an originating network entity sends an SS7 message across a national SS7 signaling network boundary, the SCCP calling party address field should include an E.212 global title address identifying the originating network entity to allow response messages (RETURN RESULT, RETURN ERROR, or REJECT) to be routed back to the originating network entity.
- Replies to messages shall use the received Calling Party Address as the Called Party Address, in accordance with *ANSI T1.112*. (An exception occurs if the PC_SSN parameter is received in an AuthenticationRequest INVOKE or in a RegistrationNotification INVOKE. In this case, the address used for the response may be derived from the received PC_SSN parameter provided that the INVOKE was received from a network entity within the same national SS7 signaling network.)