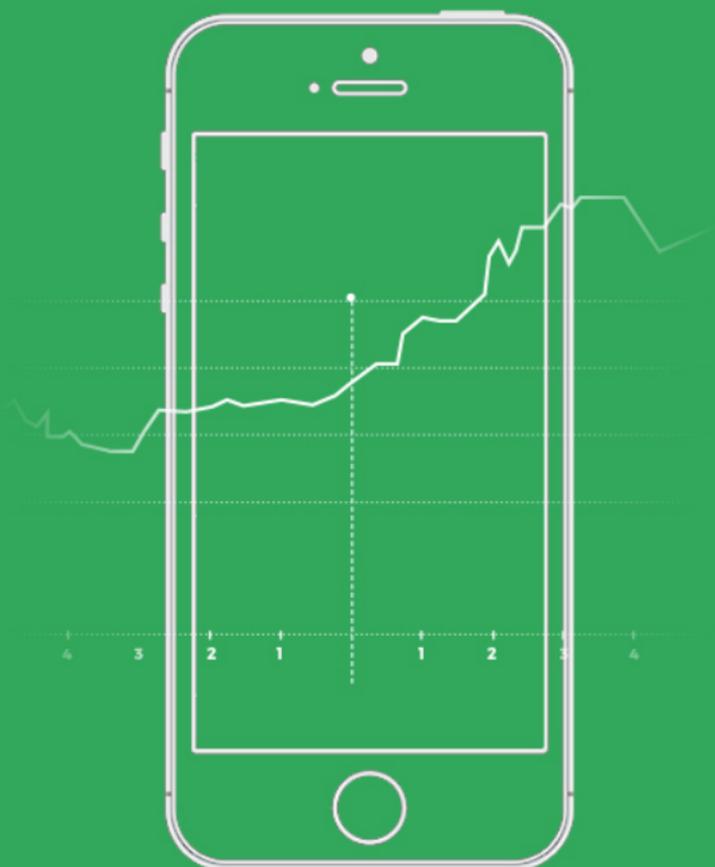


SS7 POCKET GUIDE



Your Guide to Signalling System 7

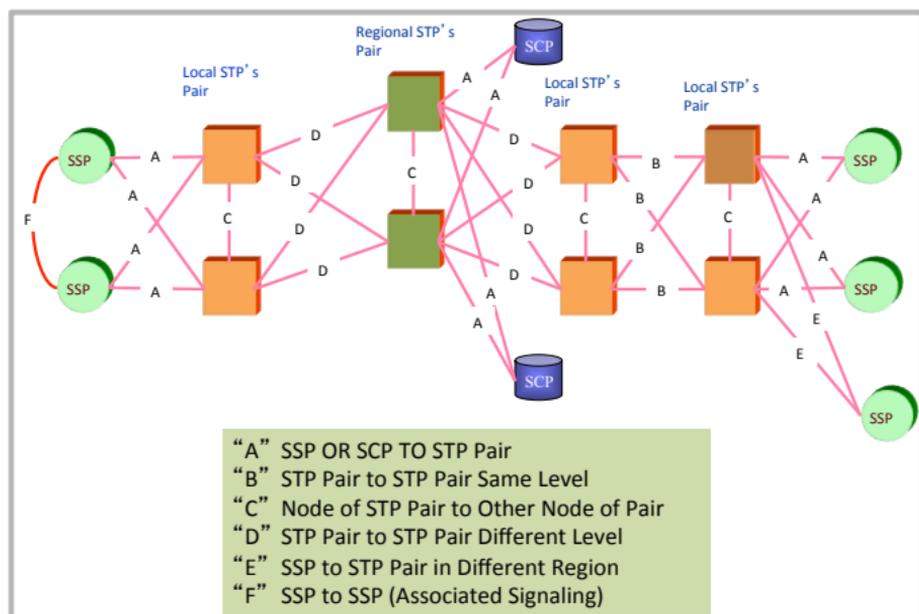
Cellusys^o

www.cellusys.com

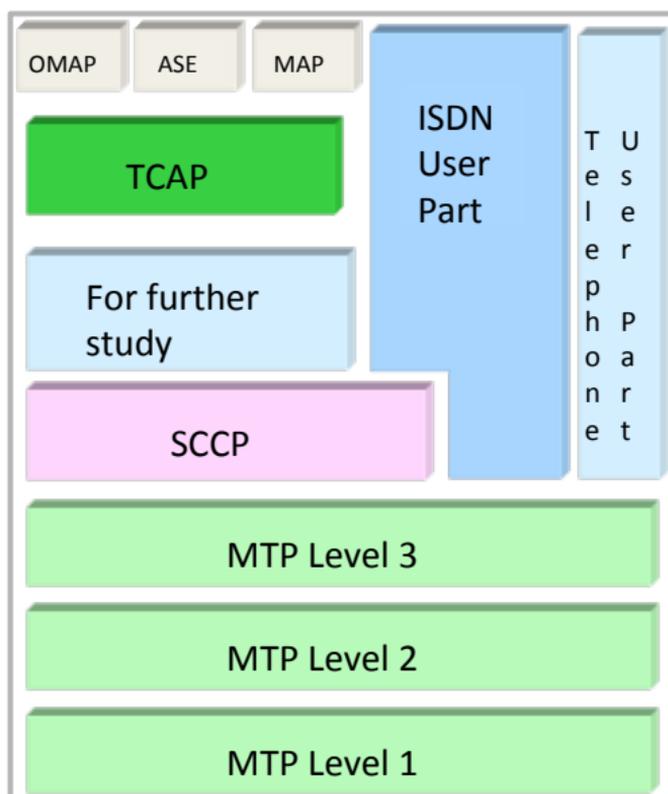
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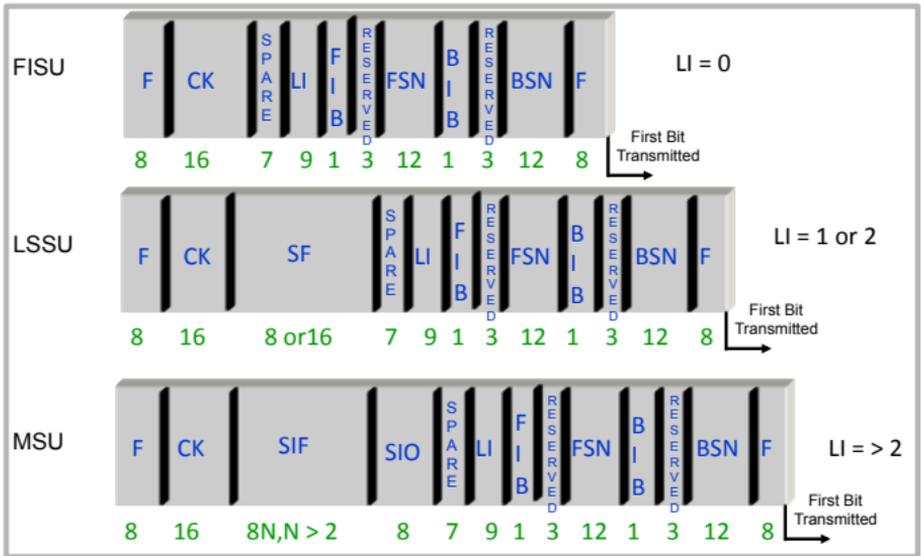
Network and Link Designations



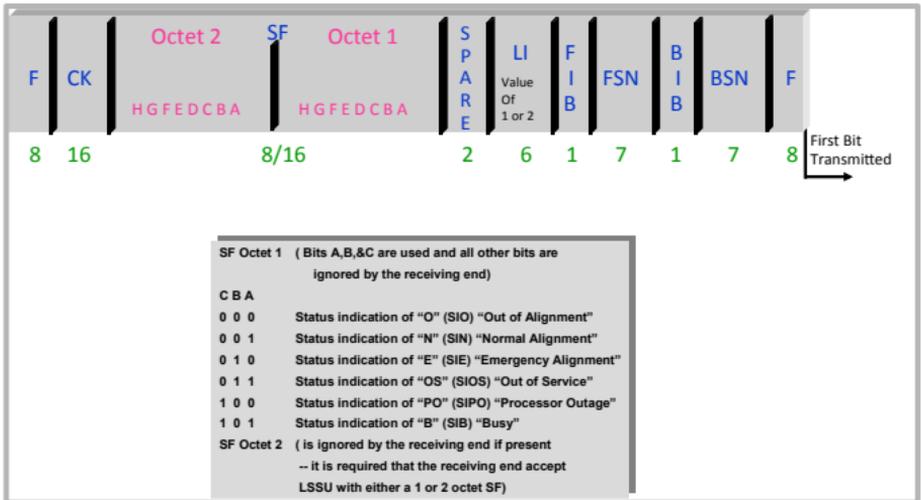
SS7 Protocol Levels



Signal Unit Format



LSSU Status Field Format



Notes:

LSSU Status Field Definitions

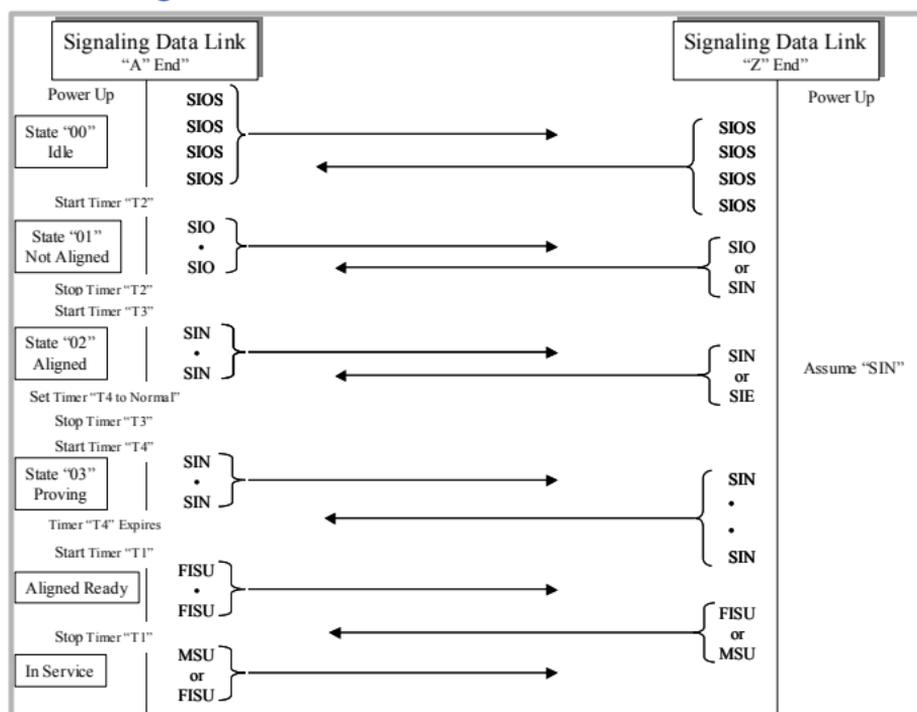
SF Octet 1 (Bits A,B,&C are used and all other bits are ignored by the receiving end)

C B A

- 0 0 0** Status indication of "O" (SIO) "Out of Alignment"
- 0 0 1** Status indication of "N" (SIN) "Normal Alignment"
- 0 1 0** Status indication of "E" (SIE) "Emergency Alignment"
- 0 1 1** Status indication of "OS" (SIOS) "Out of Service"
- 1 0 0** Status indication of "PO" (SIPO) "Processor Outage"
- 1 0 1** Status indication of "B" (SIB) "Busy"

SF Octet 2 (is ignored by the receiving end if present
-- it is required that the receiving end accept LSSU with either a 1 or 2 octet SF)

Initial Alignment Process (Best Case)

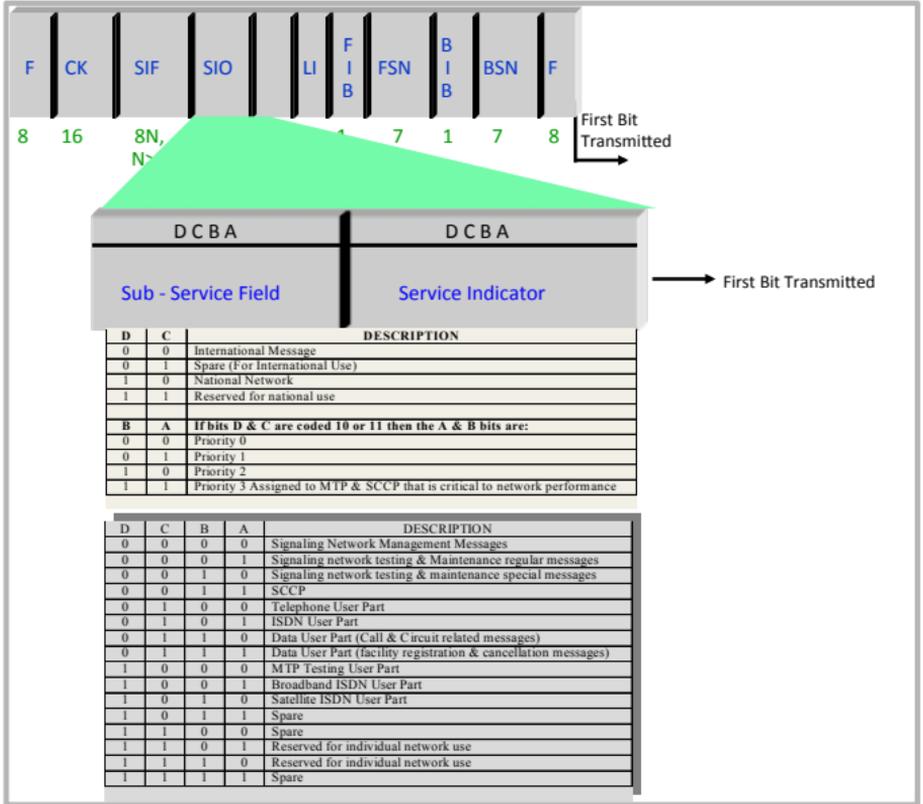


Notes:

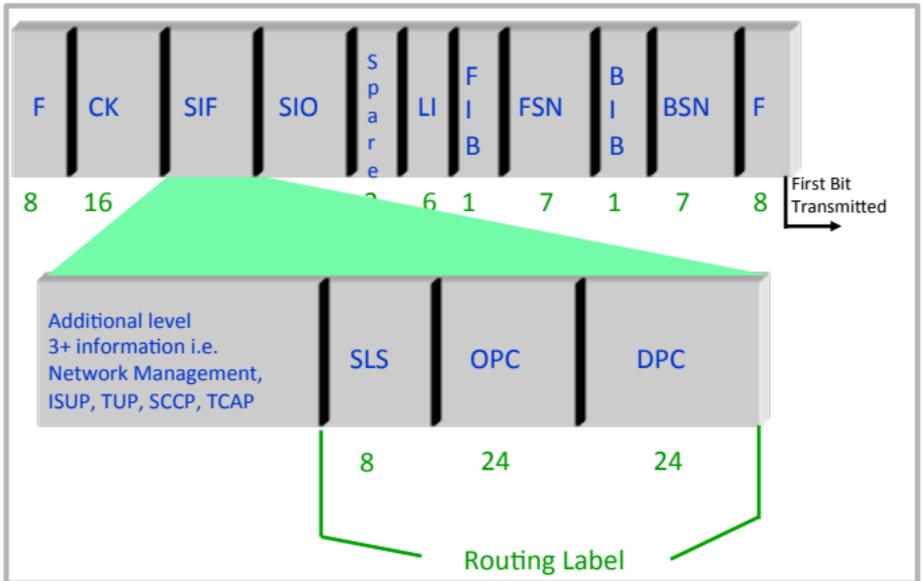
MTP Level 2 Timers

Timer	Name	ITU	Value	ANSI
T1	"Aligned Ready"	40 to 50 Sec.	13 to 30 Sec. Nom. 13 Sec.	
T2	"Not Aligned"	5 to 50 Sec. Low: 5 to 50 Sec. High: 70 to 150 Sec.	5 to 30 Sec. Low: 5 to 14 Sec. Nom. 11.5 Sec. High: 16 to 30 Nom. 23 Sec.	
T3	"Aligned"	1 to 1.5 Sec.	5 to 14 Sec. Nom. 11.5 Sec.	
T4	"Proving Period"	Normal: 7.5 to 9.5 Sec. Nom. 8.2 Sec. Emergency: 400 to 600 ms Nom. 500 ms	56kpbs Normal: 2.3 Sec +/- 10% 56kpbs Emergency: .6 Sec +/- 10%	
T5	"Sending SIB"	80 to 120 ms	1.536 Normal 30 Sec. +/- 10% 1.536 Emergency 5 Sec +/- 10%	
T6	"Remote Congestion"	3 to 6 Sec.	80 to 120 ms	
T7	"Excessive Delay Acknowledgment"	.5 to 2 Sec. (PCR .8 to 2 Sec.)	56, 64kpbs & 1.536 mbps: 1 to 6 Sec. 56, 64kpbs & 1.536 mbps: .5 to 2 Sec.	
T8	"Errored Interval Monitor"		100 ms for 1.536mbps	

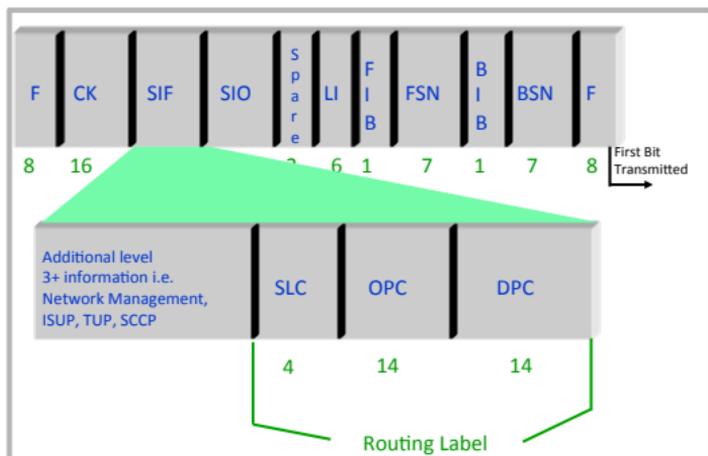
Service Information Octet Encoding



ANSI Routing Label



ITU Routing Label

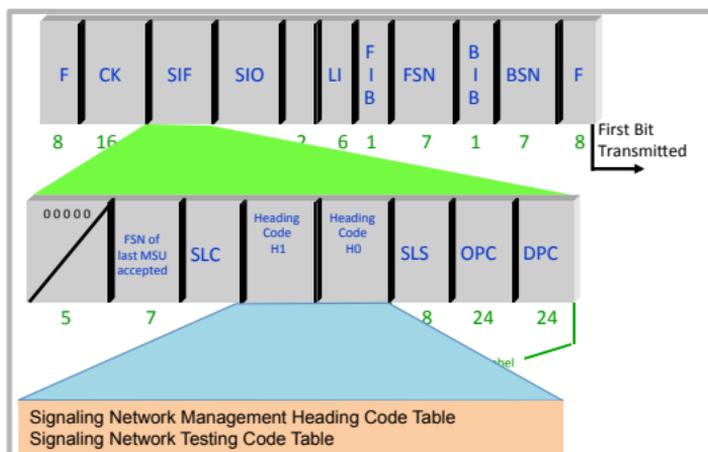


International Point Code Structure

N M L	K J I H G F E D	C B A
Zone Identification	Area / Network Identification	Signaling Point Identification

- The Zone sub field identifies the geographical zone within the world
- The Area/Network sub field identifies the geographical area within the zone
- The Signaling Point sub field identifies the specific International Gateway

Signaling Network Management Message Structure



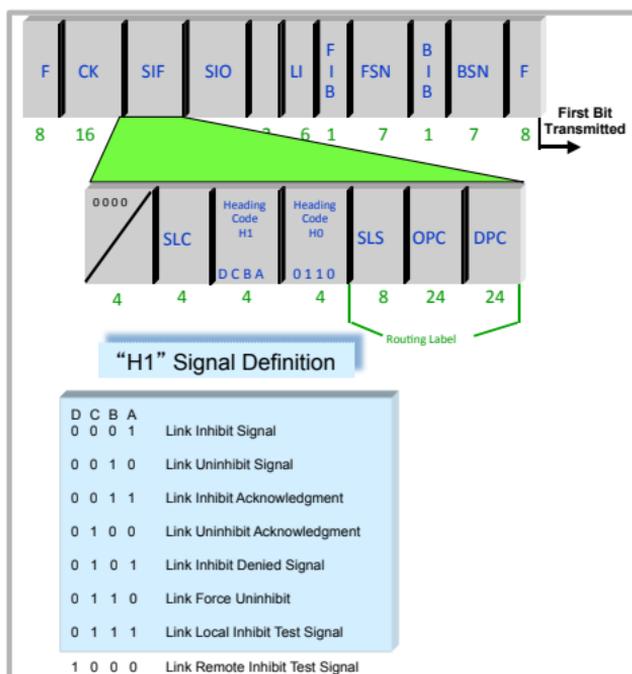
Signaling Network Management Heading Code Table

Message Group	H1	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110
0000																
CHM	0001		COO	COA				CBD	CBA							
ECM	0010		ECO	ECA												
FCM	0011		RCT	TFC												
TFM	0100		TFP	TCP	TFR	TCR	TFA	TCA								
RSM	0101		RSP	RSR	RCP	RCR										
MIM	0110		LIN	LUN	LIA	LUA	LID	LFU	LLI	LRI						
TRM	0111		TRA	TRW												
DLM	1000		DLC	CSS	CNS	CNP										
	1001															
UFC	1010		UPU													
	1011															
	1100															
	1101															
	1110															

Signaling Network Testing Code

		H0	0 0 0 1	0 0 1 0
Message Group	H1			
SNT	0 0 0 1		SLTM	SLTA

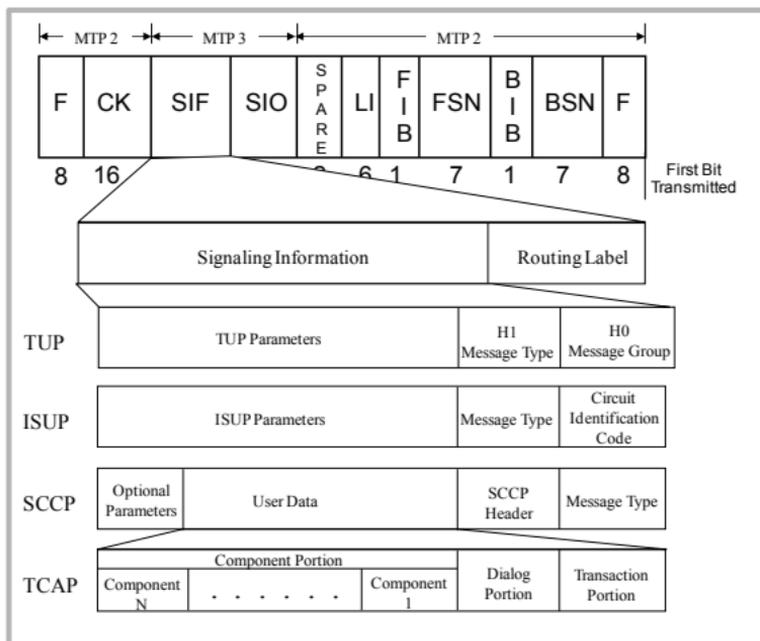
Management Inhibiting Message Structure



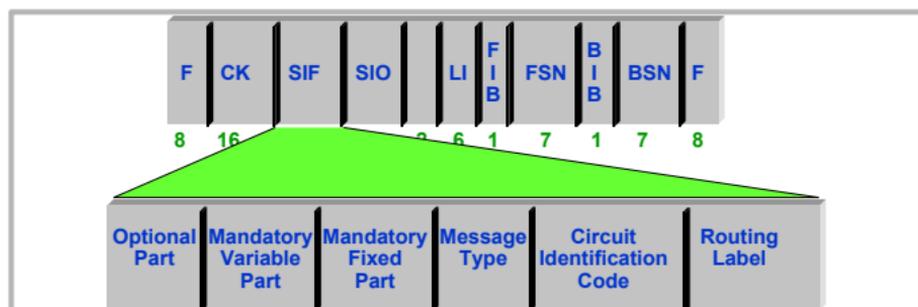
Signaling Network Management and Signaling Network Testing Acronyms

CBA	Changeback Acknowledgment Signal
CBD	Changeback Declaration Signal
CNM	Changeover and Changeback Messages
CNP	Connection Not Possible
CNS	Connection Not Successful
COA	Changeover Acknowledgment
COO	Changeover Order
CSS	Connection Successful
DLC	Signaling Data Link Connection Order Signal
DLM	Signaling Data Link Connection Order Message
ECA	Emergency Changeover Acknowledgment
ECM	Emergency Changeover Message
ECO	Emergency Changeover Order Signal
FCM	Signaling Traffic Flow Control Messages
LFU	Link Forced Uninhibit Message
LIA	Link Inhibit Acknowledgment Message
LID	Link Inhibit Denied Message
LIN	Link Inhibit Message
LLI	Link Local Inhibit Signal
LRI	Link Remote Inhibit Test Signal
LUA	Link Uninhibit Acknowledgment
LUN	Link Uninhibit Message
MSG	Message Group
MIM	Management Inhibiting Messages
RCP	Signaling Route Set Cluster Prohibited Signal
RCR	Signaling Route Set Test Cluster Restricted Signal
RCT	Signaling Route Set Congestion Test Signal
RSM	Signaling Route Set Test
RSP	Signaling Route Set Test Prohibited
RSR	Signaling Route Set Test Restricted
SLTA	Signaling Link Test Acknowledgment
SLTM	Signaling Link Test Message
TCA	Transfer Cluster Allowed Signal
TCP	Transfer Cluster Prohibited Signal
TCR	Transfer Cluster Restricted Signal
TFA	Transfer Allowed Signal
TFC	Transfer Controlled Signal
TFM	Transfer Messages Including (TFA,TFP, &TFR)
TFP	Transfer Prohibited Signal
TFR	Transfer Restricted Signal
TRA	Traffic Restart Allowed Signal
TRM	Traffic Restart Messages
TRW	Traffic Restart Waiting
UFC	MTP User Flow Control Messages
UPU	User Part Unavailable

Message Signal Unit Message Structure



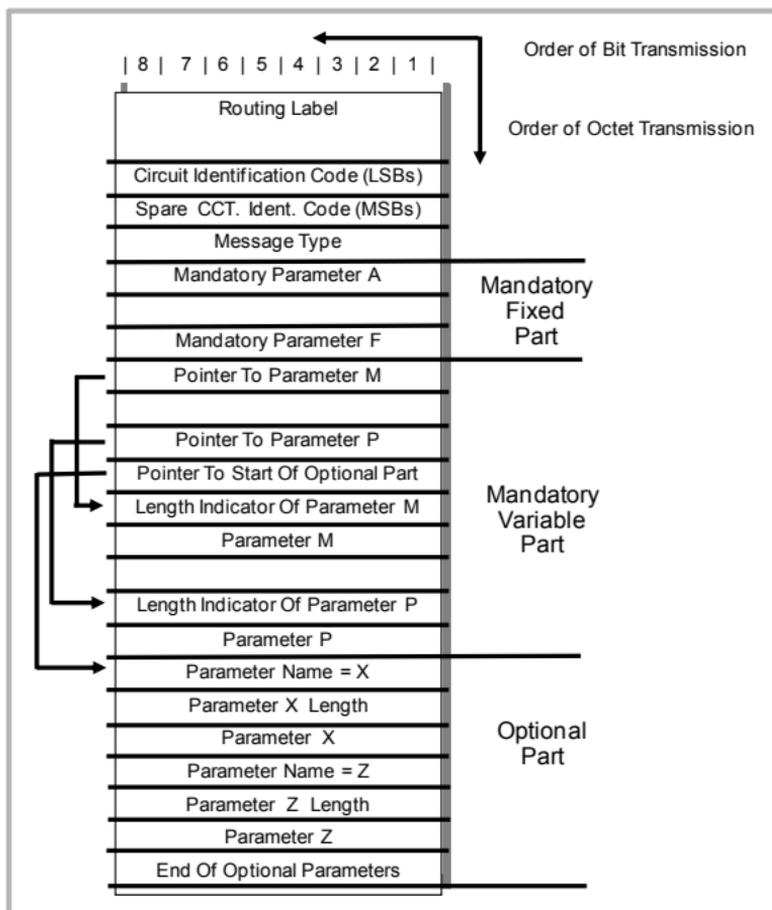
ISUP User Part Message Structure



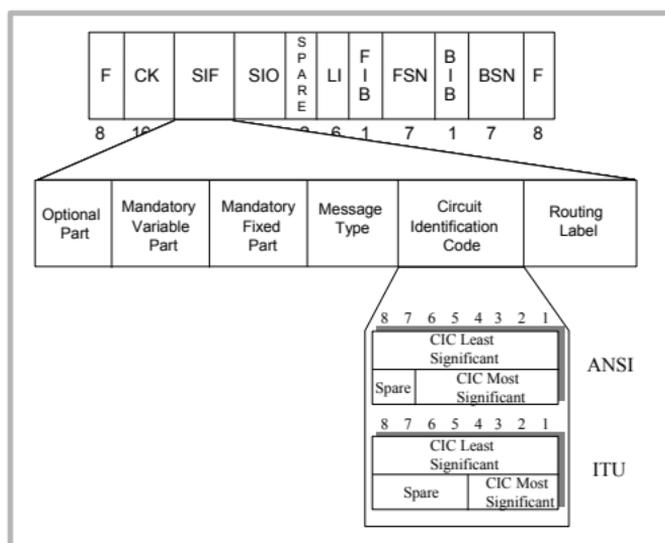
- **Routing Label** -- Address information for MTP Routing
- **Circuit Identification Code** -- Circuit that is to be assigned to a specific call
- **Message Type** -- Identifies the specific ISDN User Part Message
- **Mandatory Fixed Part** -- Those parameters that are mandatory and of a fixed length for a specific message type.
- **Mandatory Variable Part** -- Those parameters that are mandatory and of variable length for a specific message type.
- **Optional Part** -- those parameters that are optional for a specific message type. These are usually based on class of service, type of call, or features provided to the subscriber.

Notes:

ISUP Message Structure and Pointers



ISUP CIC Field – ANSI & ITU



ISUP Message Code Table

Acronym	Message Name	8 7 6 5 4 3 2 1
ACM	Address Complete	0 0 0 0 0 1 1 0
ANM	Answer	0 0 0 0 1 0 0 1
BLA	Blocking Acknowledgment	0 0 0 1 0 1 0 1
BLO	Blocking	0 0 0 1 0 0 1 1
CCR	Continuity Check Request	0 0 0 1 1 1 0 1
CFN	Confusion	0 0 1 0 1 1 1 1
CGB	Circuit Group Blocking	0 0 0 1 1 0 0 0
CGBA	CGB Acknowledgment	0 0 0 1 1 0 1 0
CGU	Circuit Group Unblocking	0 0 0 1 1 0 0 1
CGUA	CGU Acknowledgment	0 0 0 1 1 0 1 1
CMA	Call Modification Completed	0 0 0 1 1 1 0 1
CMR	Call Modification Request	0 0 0 1 1 1 0 0
CMRJ	Call Modification Reject	0 0 0 1 1 1 1 0
CON	Connect	0 0 0 0 0 1 1 1
COT	Continuity	0 0 0 0 0 1 0 1
CPG	Call Progress	0 0 1 0 1 1 1 0
CRG	Charge Information	0 0 1 1 0 0 0 1
CQM	Circuit Group Query	0 0 1 0 1 0 1 0
CQR	Circuit Group Query Response	0 0 1 0 1 0 1 1
DRS	Delayed Release	0 0 1 0 0 1 1 1
FAA	Facility Accepted	0 0 1 0 0 0 0 0
FAR	Facility Request	0 0 0 1 1 1 1 1
FOT	Forward Transfer	0 0 0 0 1 0 0 0
FRJ	Facility Reject	0 0 1 0 0 0 0 1
GRA	Circuit Group Reset Acknowledgment	0 0 1 0 1 0 0 1
GRS	Circuit Group Reset	0 0 0 1 0 1 1 1
IAM	Initial Address	0 0 0 0 0 0 0 1
INF	Information	0 0 0 0 0 1 0 0
INR	Information Request	0 0 0 0 0 0 1 1
LPA	Loop Back Acknowledgment	0 0 1 0 0 1 0 0
OLM	Overload	0 0 1 1 0 0 0 0
PAM	Pass Along	0 0 1 0 1 0 0 0
REL	Release	0 0 0 0 1 1 1 0
RES	Resume	0 0 0 0 1 1 1 0
RLC	Release Complete	0 0 0 1 0 0 0 0
RSC	Reset Circuit	0 0 0 1 0 0 1 0
SAM	Subsequent Address Message	0 0 0 0 0 0 1 0
SUS	Suspend	0 0 0 0 1 1 0 1
UBL	Unblocking	0 0 0 1 0 1 0 0
UBA	Unblocking Acknowledgment	0 0 0 1 0 1 1 0
UCIC	Unequipped Circuit Identification Code	0 0 1 0 1 1 1 0
USR	User-to-User Information	0 0 1 0 1 1 0 1

ISUP Parameter Code Table

Parameter Name	8 7 6 5 4 3 2 1
Access Delivery	0 0 1 0 1 1 1 0
Access Transport	0 0 0 0 0 0 1 1
Automatic Congestion Level	0 0 1 0 0 1 1 1
Backward Call Indicator	0 0 0 1 0 0 0 1
Backward GVNS	0 1 0 0 1 1 0 1
Business Group	1 1 0 0 0 1 1 0
CCSS	0 1 0 0 1 0 1 1
Call Diversion Information	0 0 1 1 0 1 1 0
Call Diversion Treatment Indicator	0 1 1 0 1 1 1 0
Call History Information	0 0 1 0 1 1 0 1
Call Offering Treatment Indicator	0 1 1 1 0 0 0 0
Call Reference	0 0 0 0 0 0 0 1
Call Transfer Number	0 1 0 0 0 1 0 1
Call Transfer Reference	0 1 0 0 0 0 1 1
Called IN Number	0 1 1 0 1 1 1 1
Called Party Number	0 0 0 0 0 1 0 0
Calling Party Number	0 0 0 0 1 0 1 0
Calling Party Category	0 0 0 0 1 0 0 1
Carrier Identification	1 1 0 0 0 1 0 1
Carrier Selection Information	1 1 1 0 1 1 1 0
Cause Indicators	0 0 0 1 0 0 1 0
Charge Number	1 1 1 0 1 0 1 1
Circuit Assignment Map	0 0 1 0 0 1 0 1
Circuit Group Characteristic Indicator	1 1 1 0 0 1 0 1
Circuit Group Supervision Message Type Indicator	0 0 0 1 0 1 0 1
Circuit Identification Name	1 1 1 0 1 0 0 0
Circuit State Indicator	0 0 1 0 0 1 1 0
Circuit Validation Response Indicator	1 1 1 0 0 1 1 0
Closed User Group Interlock Code	0 0 0 1 1 0 1 0
Collect Call Request	0 1 1 1 1 0 0 1
Common Language Location Identifier	1 1 1 0 1 0 0 1
Conference Treatment Indicator	0 1 1 1 0 0 1 0
Connected Number	0 0 1 0 0 0 0 1
Connection Request	0 0 0 0 1 1 0 1
Continuity Indicators	0 0 0 1 0 0 0 0
Correlation Id.	0 1 1 0 0 1 0 1
Display Information	0 1 1 1 0 0 1 1
Echo Control Information	0 0 1 1 0 1 1 1
Egress	1 1 0 0 0 0 1 1
End of Optional Parameters	0 0 0 0 0 0 0 0
Event Information	0 0 1 0 0 1 0 0
Facility Indicator	0 0 0 1 1 0 0 0
Forward Call Indicator	0 0 0 0 0 1 1 1
Forward GVNS	0 1 0 0 1 1 0 0
Generic Address	1 1 0 0 0 0 0 0
Generic Digits	1 1 0 0 0 0 0 1
Generic Name	1 1 0 0 0 1 1 1
Generic Number	1 1 0 0 0 0 0 0
Generic Notification Indicator	0 0 1 0 1 1 0 0
Hop Counter	0 0 1 1 1 1 0 1
Index	0 0 0 1 1 0 1 1

ISUP Parameter Code Table (Continued)

Parameter Name	8 7 6 5 4 3 2 1
Information Indicators	0 0 0 0 1 1 1 1
Information Request Indicators	0 0 0 0 1 1 1 0
Jurisdiction	1 1 0 0 0 1 0 0
Location Number	0 0 1 1 1 1 1 1
Loop Prevention Indicator	0 1 0 0 0 1 0 0
MCID Request Indicator	0 0 1 1 1 0 1 1
MCID Response Indicator	0 0 1 1 1 1 0 0
MLPP Precedence	0 0 1 1 1 0 1 0
Message Compatibility Information	0 0 1 1 1 0 0 0
Nature of Connection Indicators	0 0 0 0 0 1 1 0
Network Management Controls	0 1 0 1 1 0 1 1
Network Specific Facilities	0 0 1 0 1 1 1 1
Network Transport	1 1 1 0 1 1 1 1
Notification Indicator	1 1 1 0 0 0 0 1
Operator Services Information	1 1 0 0 0 0 1 0
Optional Backward Call Indicators	0 0 1 0 1 0 0 1
Optional Forward Call Indicators	0 0 0 0 1 0 0 0
Original Called Number	0 0 1 0 1 0 0 0
Origination ISC Point Code	0 0 1 0 1 0 1 1
Originating Line Information	1 1 1 0 1 0 1 0
Outgoing Trunk Number	1 1 1 0 0 1 1 1
Parameter Compatibility Information	0 0 1 1 1 0 0 1
Precedence	0 0 1 1 1 0 1 0
Propagation Delay Counter	0 0 1 1 0 0 0 1
Range and Status	0 0 0 1 0 1 1 0
Redirect Capability	0 1 0 0 1 1 1 0
Redirect Counter	0 1 1 1 0 1 1 1
Redirecting Number	0 0 0 0 1 0 1 1
Redirection Information	0 0 0 1 0 0 1 1
Redirection Number	0 0 0 0 1 1 1 0
Redirection Number Restriction	0 1 0 0 0 0 0 0
Remote Operations	0 0 1 1 0 0 1 0
SCF Id.	0 1 1 0 0 1 1 0
Service Activation	0 0 1 1 0 0 1 1
Service Code Indicator	1 1 1 0 1 1 0 0
Signaling Point Code	0 0 0 1 1 1 1 0
Special Processing Request	1 1 1 0 1 1 1 0 1
Subsequent Number	0 0 0 0 0 1 0 1
Suspend/Resume Indicators	0 0 1 0 0 0 1 0
Transaction Request	1 1 1 0 0 0 1 1
Transit Network Selection	0 0 1 0 0 0 1 1
Transmission Medium Requirements	0 0 0 0 0 0 1 0
Transmission Medium Requirements Prime	0 0 1 1 1 1 1 0
Transmission Medium Used	0 0 1 1 0 1 0 1
UID Action Indicators	0 1 1 1 0 1 0 0
UID Capability Indicators	0 1 1 1 0 1 0 1
User Service Information	0 0 0 1 1 1 0 1
User Service Information Prime	0 0 1 1 0 0 0 0
User Teleservices Information	0 0 1 1 0 1 0 0
User-to-User Indicators	0 0 1 0 1 0 1 0
User-to-User Information	0 0 1 0 0 0 0 0

ISUP Message / Parameter Table

Parameter	Message Type	ACM	ANIM	BLA	BLB	BLC	CR	CFN	CGB	CGBA	CGU	CGUA	CON	(ITU)	COT	CPG	CRA	(ANSI)	CQM	ICOR	(ANSI)	CRM	(ANSI)
Access Delivery Information		O(ITU)	O(ITU)										O(ITU)			O(ITU)							
Access Transport		O	O										O(ITU)			O							
Automatic Congestion Level																							
Backward Call Indicator		F	O										F(ITU)			O							
Backward GVNS			O(ITU)										O(ITU)			O(ANSI)							
Business Group		O(ANSI)	O(ANSI)																				
CCSS																							
Call Diversion Information		O(ITU)														O(ITU)							
Call Diversion Treatment Indicators																							
Call History Information			O(ITU)										O(ITU)			O(ITU)							
Call Modification Indicator																							
Call Offered Treatment Indicators																							
Call Reference		O	O											O		O							
Called IN Number																							
Call Transfer Number																O(ITU)							
Call Transfer Reference																							
Called Party Number																							
Calling Party Number																							
Calling Party Category																							
Carrier Identification																							
Carrier Selection Information																							
Cause Indicators		O						V															
Charge Number																							
Circuit Assignment Map																							
Circuit Group Characteristic Indicator																							
Circuit Group Supervision Message Type Indicator									F	F	F	F	F	F									

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	ACM	ANM	BLA	BLO	CCR	CFN	CGB	CGBA	CGU	CGUA	CON(ITU)	COT	CPG	CRA(ANSI)	CQM	CQR(ANSI)	CRM(ANSI)	
Circuit Identification Name																			
Circuit State Indicator																	V(ANSI)		
Circuit Validation Response Indicator																			
Closed User Group Interlock Code																			
Collect Call Request																			
Common Language Location Identifier																			
Conference Treatment Indicators		O(ITU)										O(ITU)		O(ITU)					
Connected Number		O(ANSI)	O(ITU)									O(ITU)		O(ITU)					
Connection Request		O(ANSI)	O(ANSI)																
Continuity Indicators													F						
Correlation id.																			
Display Information			O(ITU)																
Echo Control Information		O(ITU)	O(ITU)									O(ITU)		O(ITU)					
Egress																			
End of Optional Parameters		O	O											O					
Event Information																			
Event Information Indicators																			
Facility Indicator																			
Facility Information Indicator																			
Forward Call Indicator																			
Forward GVNS																			
Freephone Indicators																			
Generic Address																			
Generic Digits																			
Generic Name																			
Generic Number			O(ITU)									O(ITU)							O(ITU)

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	ACM	ANM	BLA	BLO	CCR	CFN	CGB	CGBA	CGU	CGUA	CON	(ITU)	COT	CPG	CRA	(ANSI)	COM	CQR	(ANSI)	CRM	(ANSI)
Generic Notification Indicator		O (ITU)	O (ITU)										O (ITU)		O (ITU)							
Hop Counter																						
Index																						
Information Indicators		O (ANSI)	O (ANSI)												O (ANSI)							
Information Request Indicators																						
Jurisdiction																						
Location Number																						
Loop Prevention Indicator																						
MCID Request Indicator																						
MCID Response Indicator																						
MLLP Precedence																						
Message Compatibility Information																						
Message Type		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Nature of Connection Indicators																						
Network Management Controls																						
Network Specific Facilities		O (ITU)	O (ITU)										O (ITU)		O (ITU)							
Network Transport		O (ANSI)	O (ANSI)												O (ANSI)							
Notification Indicator		O (ANSI)	O (ANSI)												O (ANSI)							
Operator Services Information																						
Optional Backward Call Indicators		O	O										O		O							
Optional Forward Call Indicators																						
Original Called Number																						
Origination ISC Point Code																						
Originating Line Information																						
Outgoing Trunk Number																						

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	ACM	ANM	BLA	BLO	CCR	CFN	CGB	CGBA	CGU	CGUA	CON(ITU)	COT	CPG	CRA(ANSI)	CQM	COR(ANSI)	CRM(ANSI)
Parameter Compatibility Information		O(ITU)	O(ITU)									O		O(ITU)				
Precedence																		
P propagation Delay Counter																		
Range and Status								V	V	V	V					V	V(ANSI)	
Redirect Capability																		
Redirect Counter																		
Redirecting Number																		
Redirection Information		O(ANSI)																
Redirection Number		O(ITU)	O											O				
Redirection Number Restriction		O(ITU)	O(ITU)									O(ITU)		O(ITU)				
Remote Operations		O	O									O(ITU)		O				
SCF id																		
Service Activation		O	O									O(ITU)		O				
Service Code Indicator																		
Signaling Point Code																		
Special Processing Request																		
Subsequent Number																		
Suspend/Resume Indicators																		
Transaction Request																		
Transit Network Selection																		
Transmission Medium Requirements																		
Transmission Medium Requirement Prime		O	O									O		O				
Transmission Medium Used		O(ITU)												O(ITU)				
UID Action Indicators																		

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	ACM	ANM	BLA	BLO	CCR	CFN	CGB	CGBA	CGJ	CGUA	CON(ITU)	COT	CPG	CRA(ANSI)	CQM	CQR(ANSI)	CRM(ANSI)	
UID Capability Indicators																			
User Service Information																			
User Service Information Prime																			
User Teleservice Information																			
User-to-User Indicators		0	0									0		0					
User-to-User Information		0	0									0		0					

Notes

ISUP Message / Parameter Table (Continued)

Parameter	CVR(ANSI) CVT(ANSI) EXM(ANSI) FAA(ITU)	FAC	FAR(ITU)	FOT	FRJ(ITU)	GRA	GRS	IAM	INF	INR	IREQ(ITU)
Access Delivery Information											
Access Transport											
Automatic Congestion Level			O(ITU)					O	O(ANSI)		
Backward Call Indicator											
Backward GYNS											
Business Group								O(ANSI) O(ITU)	O(ANSI)		
CCSS											
Call Diversion Information											
Call Diversion Treatment Indicators								O(ITU)			
Call History Information											
Call Modification Indicator											
Call Offering Treatment Indicators											
Call Reference			O(ITU)					O(ITU)	O	O	
Called IN Number								O(ITU)			
Call Transfer Number											
Call Transfer Reference											
Called Party Number								V			
Calling Party Number								O	O		
Calling Party Category								F	O		
Carrier Identification								O(ANSI)			
Carrier Selection Information								O(ANSI)			
Cause Indicators											
Charge Number											
Circuit Assignment Map											
Circuit Group Characteristic Indicator											
Circuit Group Supervision Message Type Indicator	F(ANSI)								O(ANSI) O		

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	CVR(ANSI)	CVT(ANSI)	EXM(ANSI)	FAA(ITU)	FAC	FAR(ITU)	FOT	FRJ(ITU)	GRA	GRS	IAM	INF	INR	IREQ(ITU)
Circuit Identification Name	O(ANSI)														
Circuit State Indicator															
Circuit Validation Response Indicator	F(ANSI)														
Closed User Group Interlock Code												O(ITU)			
Collect Call Request												O(ITU)			
Common Language Location Identifier	O(ANSI)											O(ITU)			
Conference Treatment Indicators												O	O	O(ANSI)	
Connected Number															
Connection Request					O(ITU)		O(ITU)								
Continuity Indicators															
Correlation id.												O(ITU)			
Display Information															
Echo Control Information												O(ITU)			
Egress												O(ANSI)			
End of Optional Parameters	O(ANSI)			O	O(ITU)	O	O(ITU)	O	O(ITU)	O(ANSI)	O(ANSI)	O	O	O	O(ITU)
Event Information															
Event Information Indicators															
Facility Indicator					F(ITU)		F(ITU)		F(ITU)						
Facility Information Indicator															
Forward Call Indicator													F		
Forward GVNS													O(ITU)		
Freephone Indicators															
Generic Address														O(ANSI)	
Generic Digits														O	
Generic Name														O(ANSI)	

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	CVR(ANSI)	CVT(ANSI)	EXM(ANSI)	FAA(ITU)	FAC	FAR(ITU)	FOTFRJ(ITU)	GRA	GRS	IAM	INF	INR	REQ(ITU)
Generic Notification Indicator						O(ITU)					O(ITU)			
Generic Reference											O(ITU)			
Hop Counter											O			
Index														
Information Indicators												F		
Information Request Indicators											O(ANSI)		F	
Jurisdiction											O(ANSI)			
Location Number											O(ITU)			
Loop Prevention Indicator														O(ITU)
MCID Request Indicator														
MCID Response Indicator														
MLLP Precedence											O(ITU)			
Message Compatibility Information														
Message Type		F(ANSI)	F(ANSI)	F	F(ITU)	F	F(ITU)	F	F(ITU)	F	F	F	F	O(ITU)
Nature of Connection Indicators											F			F(ITU)
Network Management Controls														
Network Specific Facilities											O			
Network Transport											O(ITU)	O(ITU)	O(ANSI)	
Notification Indicator											O(ANSI)			
Operator Services Information														
Optional Backward Call Indicators														
Optional Forward Call Indicators											O(ITU)			
Original Called Number											O			
Origination ISC Point Code											O(ITU)			
Originating Line Information											O(ANSI)	O(ANSI)		
Outgoing Trunk Number				O										

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	CVR(ANSI)	CVT(ANSI)	EXM(ANSI)	FAA(ITU)	FAC	FAR(ITU)	FOT FR _J (ITU)	GRA	GRS	IAM	INF	INR	IREQ(ITU)
Parameter Compatibility Information					O(ITU)	O(ITU)	O(ITU)				O(ITU)	O(ANSI)	O(ITU)	O(ITU)
Precedence														
Propagation Delay Counter									V	V				
Range and Status											O(ANSI)			
Redirect Capability											O(ANSI)			
Redirect Counter											O			
Redirecting Number											O(ANSI)			
Redirection Information											O	O(ANSI)		
Redirection Number											O	O(ANSI)		
Redirection Number Restriction														
Remote Operations						O					O			
SCF id											O(ITU)			
Service Activation						O					O			
Service Code Indicator											O(ANSI)			
Signaling Point Code														
Special Processing Request											O(ANSI)			
Subsequent Number														
Suspend/Resume Indicators														
Transaction Request											O(ANSI)			
Transit Network Selection											O			
Transmission Medium Requirements														
Transmission Medium Requirement Prime											F(ITU)			
Transmission Medium Used											O(ITU)			
UID Action Indicators														

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	CVR(ANSI)CVT(ANSI)EXM(ANSI)FAA(ITU)	FAC	FAR(ITU)	FOT	FRJ(ITU)	GRA	GRS	IAM	INF	INR	REQ(ITU)
UID Capability Indicators									O(ITU)			
User Service Information									O(ITU) V(ANSI)			
User Service Information Prime									O			
User Teleservice Information									O(ITU)			
User-to-User Indicators									O(ITU)			
User-to-User Information									O	O(ANSI)		

Notes

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	RES(ITU)	LPA	LPR(ITU)	NRM(ITU)	OLM(ITU)	PAM	REL	RES	RLC	RSC	SAM(ITU)	SEG(ITU)	SUS	UBL	UBA	UCIC	LPA(ITU)	UPT(ITU)	USR(ITU)
Access Delivery Information																				
Access Transport																				
Automatic Congestion Level	O(ITU)							O(ITU)					O(ITU)							O(ITU)
Backward Call Indicator								O												
Backward GVNS																				
Business Group																				
CCSS																				
Call Diversion Information																				
Call Diversion Treatment Indicators																				
Call History Information																				
Call Modification Indicator																				
Call Offering Treatment Indicators																				
Call Reference								O(ANSI)	O											
Called IN Number																				
Call Transfer Number																				
Call Transfer Reference																				
Called Party Number																				
Calling Party Number																				
Calling Party Category	O(ITU)																			
Carrier Identification																				
Carrier Selection Information																				
Cause Indicators								V					O(ITU)							
Charge Number								O(ANSI)												
Circuit Assignment Map																				
Circuit Group Characteristic Indicator																				
Circuit Group Supervision Message Type Indicator																				

ISUP Message / Parameter Table (Continued)

Parameter	Message Type	IRIS (ITU)	LPA	LPR (ITU)	NRM (ITU)	OLM (ITU)	PAM	REL	RES	RLC	RSC	SAM (ITU)	SEG (ITU)	SUS	UBL	UBA	UCIC	UPA (ITU)	UPT (ITU)	USR (ITU)		
Circuit Identification Name																						
Circuit State Indicator																						
Circuit Validation Response Indicator																						
Closed User Group Interlock Code																						
Collect Call Request																						
Common Language Location Identifier																						
Conference Treatment Indicators																						
Connected Number																						
Continuity Request																						
Continuity Indicators																						
Correlation id.																						
Display Information																						
Echo Control Information																						
Egress																						
End of Optional Parameters																						
Event Information																						
Event Information Indicators																						
Facility Indicator																						
Facility Information Indicator																						
Forward Call Indicator																						
Forward GYNS																						
Freephone Indicators																						
Generic Address																						
Generic Digits																						
Generic Name																						
Generic Name																						
Generic Number																						
Generic Number																						

ISUP Message / Parameter Table (Continued)

Message Type	RES(ITU)	LPA	LPR(ITU)	NRM(ITU)	OLM(ITU)	PAM	REL	RES	RLC	RSC	SAM(ITU)	SEG(ITU)	SUS	UBL	UBA	UCIC	UPA(ITU)	UPT(ITU)	USR(ITU)
Parameter																			
Generic Notification Indicator												O(ITU)							
Generic Reference																			
Hop Counter																			
Index																			
Information Indicators																			
Information Request Indicators																			
Jurisdiction																			
Location Number																			
Loop Prevention Indicator																			
MCID Request Indicator																			
MCID Response Indicator																			
MILLP Precedence																			
Message Compatibility Information																			
Message Type																			
Nature of Connection Indicators																			
Network Management Controls																			
Network Specific Facilities																			
Network Transport																			
Notification Indicator																			
Operator Services Information																			
Optional Backward Call Indicators																			
Optional Forward Call Indicators																			
Original Called Number																			
Origination ISC Point Code																			
Originating Line Information																			
Outgoing Trunk Number																			

ISUP Message / Parameter Table (Continued)

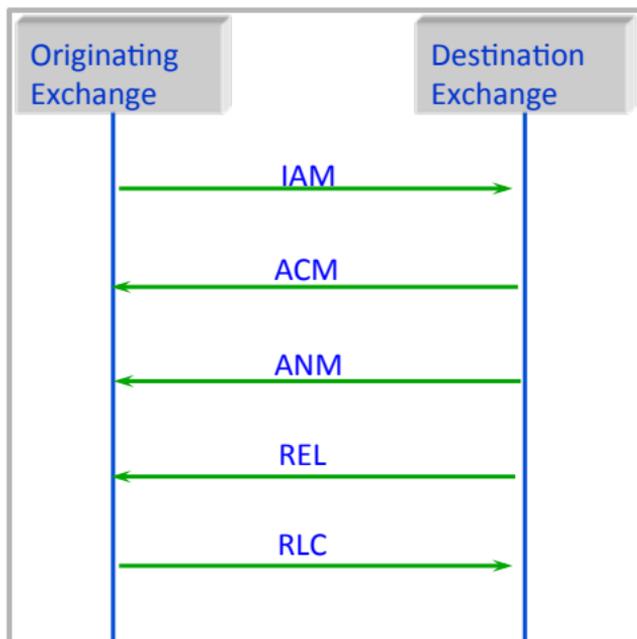
Message Type	IPRES(ITU)	LPA	LPR(ITU)	NRM(ITU)	OLM(ITU)	PAM	REL	RES	RLC	RSC	SAM(ITU)	SEG(ITU)	SUS	UBL	UBA	UCIC	UPA(ITU)	UPT(ITU)	USR(ITU)
Parameter																			
Parameter Compatibility Information	O(ITU)		O(ITU)	O(ITU)			O(ITU)										O(ITU)	O(ITU)	
Precedence																			
Propagation Delay Counter																			
Range and Status																			
Redirect Capability																			
Redirect Counter																			
Redirecting Number																			
Redirection Information							O(ITU)												
Redirection Number							O												
Redirection Number Restriction																			
Remote Operations							O(ITU)												
SCF id																			
Service Activation							O(ANSI)												
Service Code Indicator																			
Signaling Point Code							O(ITU)												
Special Processing Request																			
Subsequent Number											V(ITU)								
Suspend/Resume Indicators								F											
Transaction Request																			
Transit Network Selection																			
Transmission Medium Requirements																			
Transmission Medium Requirement Prime																			
Transmission Medium Used																			
UID Action Indicators																			

ISUP Message / Parameter Table (Continued)

Message Type	IRES (ITU)	LPA	LPR (ITU)	NRM (ITU)	OLM (ITU)	PAM	REL	RES	RLC	RSC	SAM (ITU)	SEG (ITU)	SUS	UBL	UBA	UCIC	UPA (ITU)	UPT (ITU)	USR (ITU)	
Parameter																				
UID Capability Indicators																				
User Service Information																				
User Service Information Prime																				
User Teleservice Information																				
User-to-User Indicators							O (ITU)													
User-to-User Information							O					O (ITU)								V (ITU)

Notes

ISUP Call Setup Message Flow (Basic)



TUP Heading Code Abbreviations

ACB	Access Barred
ACC	Automatic Congestion Control
ACM	Address Complete
ADI	Address Incomplete
ANC	Answer Signal Charge
ANN	Answer Signal No Charge
ANU	Answer Signal Unqualified
BLA	Blocking Acknowledgment
BLO	Blocking Signal
BSM	Backward Set-up Message
CBK	Clear Back
CCF	Continuity Failure
CCL	Calling Party Clear
CCM	Circuit Supervision Message
CCR	Continuity Check Request Signal
CFL	Call Failure Signal
CGC	Circuit Group Congestion Signal
CHG	Charging Message
CLF	Clear Forward Signal
CNM	Circuit Network Management Message Group
COT	Continuity Signal
CSM	Call Supervision Message

TUP Heading Code Abbreviations (Continued)

DPN	Digital Path Not Provided
EUM	Extended Unsuccessful Backward Set-up Information Message
FAM	Forward Address Message
FOT	Forward Transfer Signal
FSM	Forward Set-up Message
GRA	Circuit Group Reset Acknowledgment Message
GRM	Circuit Group Supervision Messages
GRQ	General Request Message
GRS	Circuit Group Reset Message
GSM	General Forward Set-up Information Message
HBS	Hardware Failure Oriented Group Blocking Acknowledgment Message
GHG	Hardware Failure Oriented Group Blocking Message
HGU	Hardware Failure Oriented Group Unblocking Message
HUA	Hardware Failure Oriented Group Unblocking Acknowledgment Message
IAI	Initial Address Message with Additional Information
IAM	Initial Address Message
LOS	Line Out-of-Service Signal
MBA	Maintenance Oriented Group Blocking Acknowledgment Message
MBG	Maintenance Oriented Group Blocking Message
MBU	Maintenance Oriented Group Unblocking Message
MPR	Misdialed Trunk Prefix
MUA	Maintenance Oriented Group Unblocking Acknowledgment Message
NNC	Network-Network Congestion Signal
RAN	Reanswer Signal
RLG	Release Guard Signal
RSC	Reset Circuit Signal
SAM	Subsequent Address Message
SAO	Subsequent Address Message with One Signal
SBA	Software Generated Group Blocking Acknowledgment Message
SBM	Successful Backward Set-up Information Message
SEC	Switching Equipment Congestion Signal
SGB	Software Generated Group Blocking Message
SGU	Software Generated Group Unblocking Message
SSB	Subscriber-Busy Signal (Electrical)
SST	Send Special Information Tone Signal
SUA	Software Generated Group Unblocking Acknowledgment

TUP Heading Code Abbreviations (Continued)

UBA	Unblocking Acknowledgment Signal
UBL	Unblocking Signal
UBM	Unsuccessful Backward Set-up Information Message
UNN	Unallocated Number Signal

TUP Message Code Table

Message Group	HI H0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
FAM	0001		IAM	IAI	SAM	SAO											
FSM	0010		GSM		COT	CCF											
BSM	0011		GRQ														
SBM	0100		ACM	CHG													
UBM	0101		SEC	CGC	NNC	ADI	CFL	SSB	UNN	LOS	SST	ACB	DPN	MPR			EUM
CSM	0110	ANU	ANC	ANN	CBK	CLF	RAN	FOT	CCL								
CCM	0111		RLG	BLO	BLA	UBL	UBA	CCR	RSC								
GRM	1000		MGB	MBA	MGU	MUA	HGB	HBA	HGU	HUA	GRS	GRA	SGB	SBA	SGU	SUA	
CNM	1010		ACC														

SCCP Messages and Protocol Classes

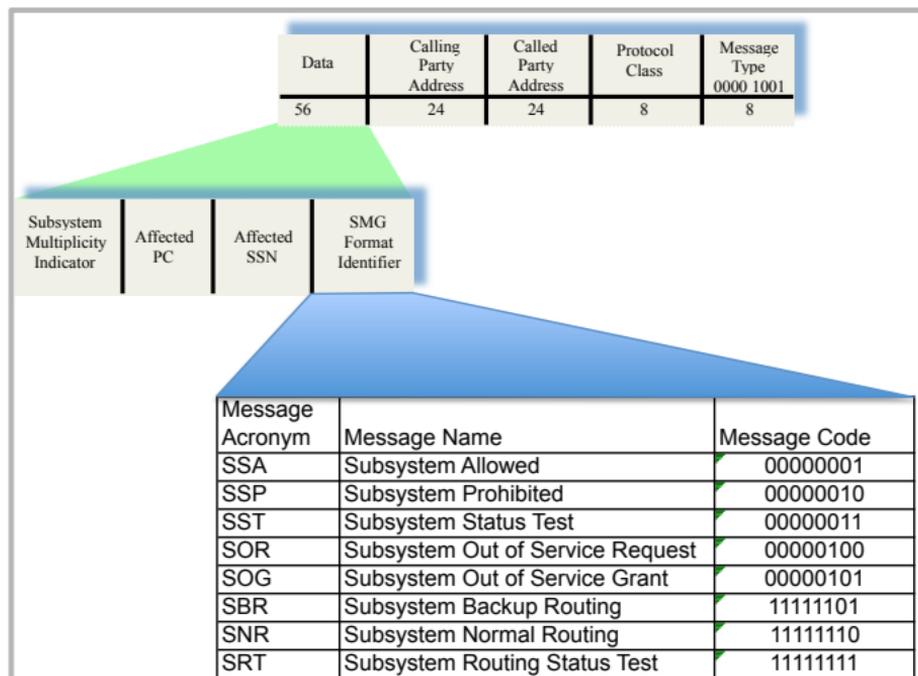
Protocol Class				Message Acronym	Message Type	Message Type Code							
0	1	2	3			8	7	6	5	4	3	2	1
		X	X	CR	Connection Request	0	0	0	0	0	0	0	1
		X	X	CC	Connection Confirmation	0	0	0	0	0	0	1	0
		X	X	CREF	Connection Refused	0	0	0	0	0	0	1	1
		X	X	RLSD	Released	0	0	0	0	0	1	0	0
		X	X	RLC	Release Complete	0	0	0	0	0	1	0	1
		X		DT1	Data Form 1	0	0	0	0	0	1	1	0
		X		DT2	Data Form 2	0	0	0	0	0	1	1	1
		X		AK	Data Acknowledgment	0	0	0	0	1	0	0	0
X	X			UDT	Unit Data	0	0	0	0	1	0	0	1
X	X			UDTS	Unit Data Service	0	0	0	0	1	0	1	0
		X		ED	Expedited Data	0	0	0	0	1	0	1	1
		X		EA	Expedited Data Acknowledgment	0	0	0	0	1	1	0	0
		X		RSR	Reset Request	0	0	0	0	1	1	0	1
		X		RSC	Reset Confirmation	0	0	0	0	1	1	1	0
	X	X		ERR	Error	0	0	0	0	1	1	1	1
	X	X		IT	Inactivity Test	0	0	0	1	0	0	0	0
X	X			XUDT	Extended Unit Data	0	0	0	1	0	0	0	1
X	X			XUDTS	Extended Unit Data Service	0	0	0	1	0	0	1	0
X	X			LUDT	Long Unit Data	0	0	0	1	0	0	1	1
X	X			LUOTS	Long Unit Data Service	0	0	0	1	0	1	0	0

SCCP Parameter Code Table

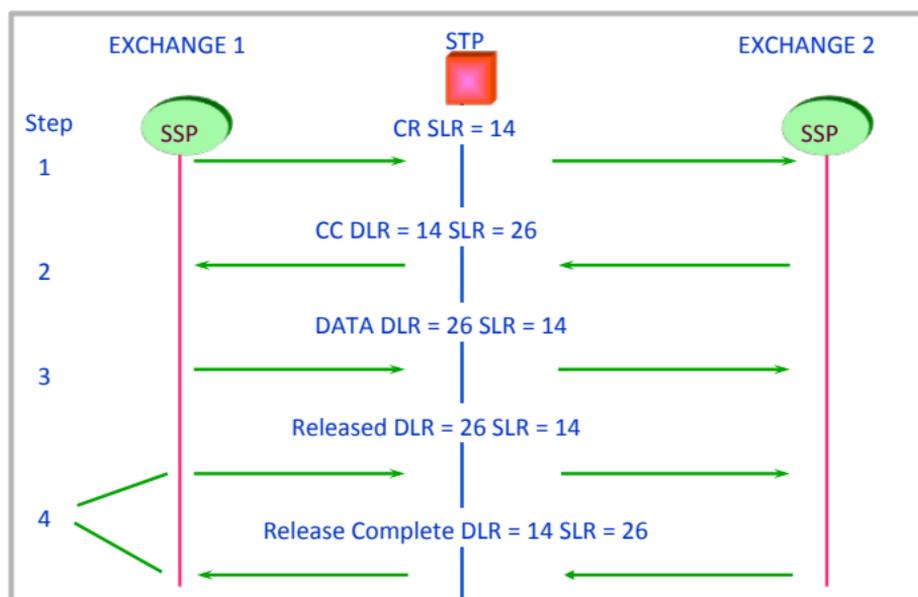
Parameter Name	Parameter Code							
End of Optional Parameters	0	0	0	0	0	0	0	0
Destination Local Reference	0	0	0	0	0	0	0	1
Source Local Reference	0	0	0	0	0	0	0	1
Called Party Address	0	0	0	0	0	0	1	1
Calling Party Address	0	0	0	0	0	1	0	0
Protocol Class	0	0	0	0	0	1	0	1
Segmenting / reassembly	0	0	0	0	0	1	1	0
Receive Sequence Number	0	0	0	0	0	1	1	1
Sequencing / Segmenting	0	0	0	0	1	0	0	0
Credit	0	0	0	0	1	0	0	1
Release Cause	0	0	0	0	1	0	1	0
Return Cause	0	0	0	0	1	0	1	1
Reset Cause	0	0	0	0	1	1	0	0
Error Cause	0	0	0	0	1	1	0	1
Refusal Cause	0	0	0	0	1	1	1	0
Data	0	0	0	0	1	1	1	1
Segmentation	0	0	0	1	0	0	0	0
SCCP Hop Counter	0	0	0	1	0	0	0	1
Reserved	0	0	0	1	0	0	1	0
Long Data	0	0	0	1	0	0	1	1
Intermediate Signaling Network Identifier	0	0	0	1	0	1	0	0

Notes:

SCCP Management Message Format



SCCP Connection Oriented Message Flow



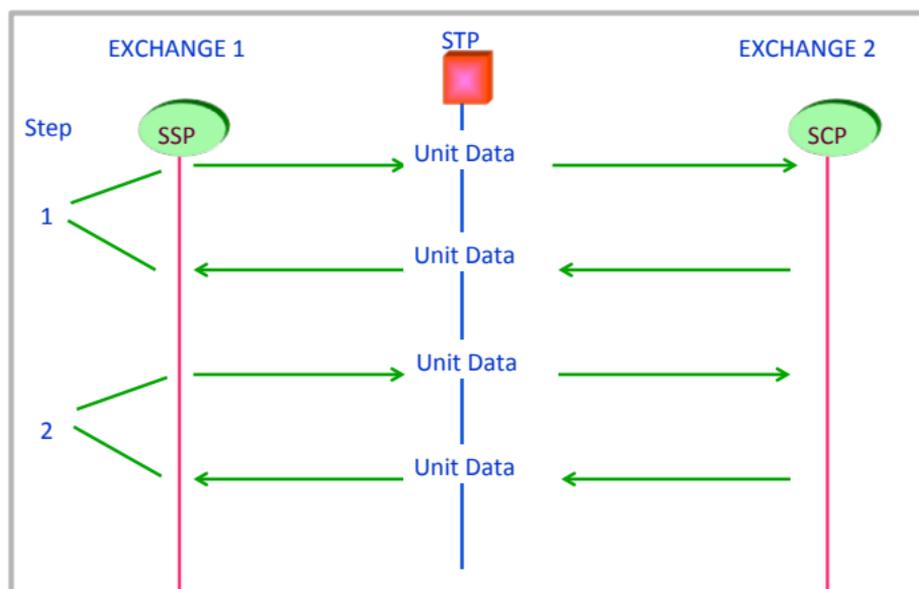
SCCP Message / Parameter Table

Messages																					
Parameters	CR	CC	CREF	RLSD	RLC	DT1	DT2	AK	ED	EA	RSR	RSC	ERR	IT	UDT	XUDT	UDTS	XUDT	LUDT	LUPTS	
Message Type Code	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Destination Local Reference	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Source Local Reference	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Called Party Address	M	O	O											M	M	M	M	M	M	M	M
Calling Party Address	O													M	M	M	M	M	M	M	M
Protocol Class	M	M												M	M	M	M	M	M	M	M
Segmenting / Reassembly						M															
Receive Sequence #							M							M(1)							
Sequencing / Segmenting								M						M(1)							
Credit	O	O																			
Release Cause				M																	
Return Cause																					M
Reset Cause											M										
Error Cause													M								
Data	O	O	O	O		M	M		M-						M	M	M	M			
Refusal Cause			M																		
End Of Optional Parameters	O	O	O	O												O			O	O	O
SCCP Hop Counter	O															M			M	M	M
Segmentation																				O(2)	O
INSI																	O		O	O	O
Long Data																					M

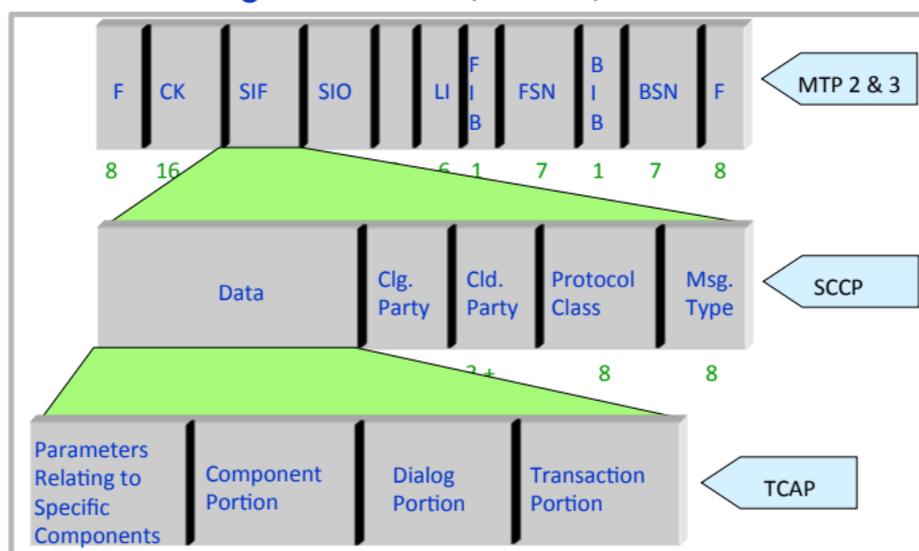
1. Information is ignored if the protocol class is 2.

2. Segmentation parameter must be included by the originating node, if interworking is expected with a MTP network or part of a network that doesn't support SAAL - Signaling Links.

SCCP Connectionless Message Flow

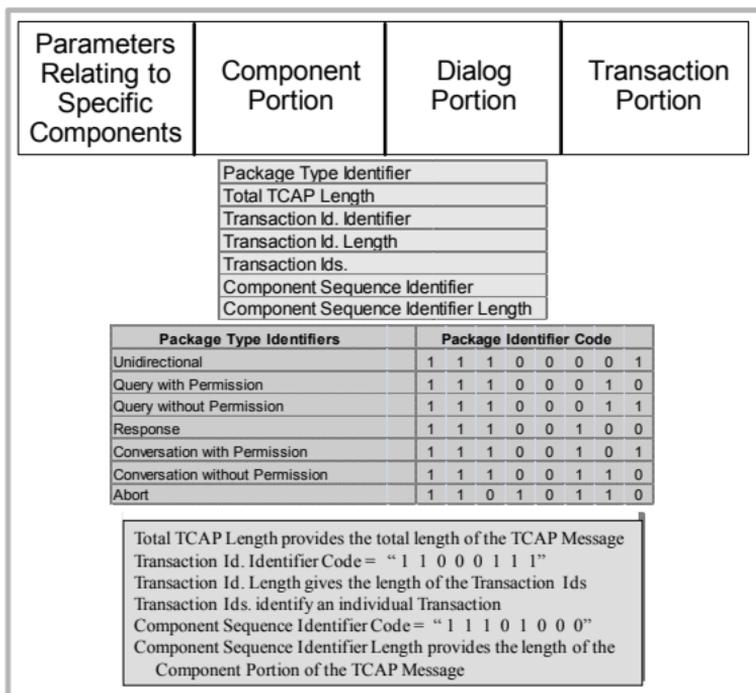


TCAP Message Structure (General)

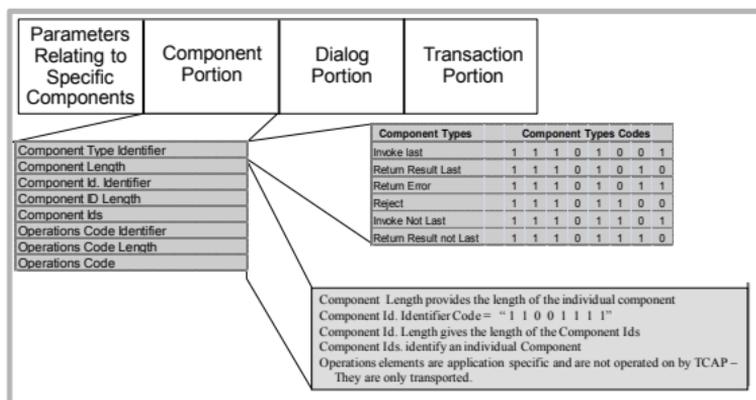


Notes:

TCAP Transaction Portion



TCAP Component Portion



Notes:

Glossary of SS7 Acronyms

BIB	Backward Indicator Bit
BSN	Backward Sequence Number
CCS	Common Channel Signaling
CIC	Circuit Identification Code
DPC	Destination Point Code
DUP	Data User Part
FCS	Frame Check Sequence
FIB	Forward Indicator Bit
FSN	Forward Sequence Number
FISU	Fill-In Signal Unit
ISPC	International Signaling Point Code
ISUP	ISDN User Part
LI	Length Indicator
LSSU	Link Status Signal Unit
MSU	Message Signal Unit
MTP	Message Transfer Part
OMAP	Operations and Maintenance Application Part
OPC	Origination Point Code
SANC	Signaling Area Network Code
SCCP	Signaling Connection Control Part
SCP	Service Control Point
SEP	Signaling End Point
SF	Status Field
SI	Service Indicator
SIF	Signaling Information Field
SIO	Service Information Octet
SLC	Signaling Link Code
SLS	Signaling Link Selection
SNM	Signaling Network Management
SNT	Signaling Network Testing
SP	Signaling Point
SPR	Signaling Point with SCCP Relay Function
SSF	Sub-Service Field
SSP	Service Switching Point
STP	Signal Transfer Point
SU	Signal Unit
TC	Transaction Capabilities

References

Telcordia Technologies Specification of Signaling System Number 7
GR-246-CORE, Issue 8, December 2003

ITU Recommendations Q.700—Q.766

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