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v 2.0

Date: July 2007

<u>Mobile Application Part (MAP) -</u>

OPERATIONS SIGNALING PROTOCOLS

REVISION HISTORY

Revision	Date	Remarks
X.S0004-540-E v2.0	July 2007	Incorporated changes from Miscellaneous Rev. E standards.

PART 540

1 MAP OPERATIONS

1.1 General

This specification supports systems conforming to air-interface technologies AMPS, NAMPS, TDMA and CDMA, including cdma2000®.[1]

1.2 Operation Formats

This Standard employs the TCAP operation formats defined in ANSI T1.114 with the exceptions and limitations specified in 1.3.1.

1.2.1 Parameters cross references

The references pertaining to the parameters included in each of the operations refer to MAP-550-E. For example the ActionCode parameter includes a cross reference 2.2. This should be read as MAP-550-2.2.

1.3 Operation Specifiers

Table 1   MAP Operation Specifiers

Operation Name	Operation Specifier								
	H	G	F	E	D	C	B	A	Decimal
not used	0	0	0	0	0	0	0	0	0
HandoffMeasurementRequest	0	0	0	0	0	0	0	1	1
FacilitiesDirective	0	0	0	0	0	0	1	0	2
MobileOnChannel	0	0	0	0	0	0	1	1	3
HandoffBack	0	0	0	0	0	1	0	0	4
FacilitiesRelease	0	0	0	0	0	1	0	1	5
QualificationRequest	0	0	0	0	0	1	1	0	6
QualificationDirective	0	0	0	0	0	1	1	1	7
Blocking	0	0	0	0	1	0	0	0	8
Unblocking	0	0	0	0	1	0	0	1	9

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[1]   cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.

Operation Name	Operation Specifier								
	H	G	F	E	D	C	B	A	Decimal
ResetCircuit	0	0	0	0	1	0	1	0	10
TrunkTest	0	0	0	0	1	0	1	1	11
TrunkTestDisconnect	0	0	0	0	1	1	0	0	12
RegistrationNotification	0	0	0	0	1	1	0	1	13
RegistrationCancellation	0	0	0	0	1	1	1	0	14
LocationRequest	0	0	0	0	1	1	1	1	15
RoutingRequest	0	0	0	1	0	0	0	0	16
FeatureRequest	0	0	0	1	0	0	0	1	17
Reserved	0	0	0	1	0	0	1	0	18
Reserved	0	0	0	1	0	0	1	1	19
UnreliableRoamerDataDirective	0	0	0	1	0	1	0	0	20
Reserved	0	0	0	1	0	1	0	1	21
MSInactive	0	0	0	1	0	1	1	0	22
TransferToNumberRequest	0	0	0	1	0	1	1	1	23
RedirectionRequest	0	0	0	1	1	0	0	0	24
HandoffToThird	0	0	0	1	1	0	0	1	25
FlashRequest	0	0	0	1	1	0	1	0	26
AuthenticationDirective	0	0	0	1	1	0	1	1	27
AuthenticationRequest	0	0	0	1	1	1	0	0	28
BaseStationChallenge	0	0	0	1	1	1	0	1	29
AuthenticationFailureReport	0	0	0	1	1	1	1	0	30
CountRequest	0	0	0	1	1	1	1	1	31
InterSystemPage	0	0	1	0	0	0	0	0	32
UnsolicitedResponse	0	0	1	0	0	0	0	1	33
BulkDeregistration	0	0	1	0	0	0	1	0	34
HandoffMeasurementRequest2	0	0	1	0	0	0	1	1	35
FacilitiesDirective2	0	0	1	0	0	1	0	0	36
HandoffBack2	0	0	1	0	0	1	0	1	37
HandoffToThird2	0	0	1	0	0	1	1	0	38
AuthenticationDirectiveForward	0	0	1	0	0	1	1	1	39
AuthenticationStatusReport	0	0	1	0	1	0	0	0	40
Reserved	0	0	1	0	1	0	0	1	41
InformationDirective	0	0	1	0	1	0	1	0	42
InformationForward	0	0	1	0	1	0	1	1	43
InterSystemAnswer	0	0	1	0	1	1	0	0	44

Operation Name	Operation Specifier								
	H	G	F	E	D	C	B	A	Decimal
InterSystemPage2	0	0	1	0	1	1	0	1	45
InterSystemSetup	0	0	1	0	1	1	1	0	46
OriginationRequest	0	0	1	0	1	1	1	1	47
RandomVariableRequest	0	0	1	1	0	0	0	0	48
RedirectionDirective	0	0	1	1	0	0	0	1	49
RemoteUserInteractionDirective	0	0	1	1	0	0	1	0	50
SMSDeliveryBackward	0	0	1	1	0	0	1	1	51
SMSDeliveryForward	0	0	1	1	0	1	0	0	52
SMSDeliveryPointToPoint	0	0	1	1	0	1	0	1	53
SMSNotification	0	0	1	1	0	1	1	0	54
SMSRequest	0	0	1	1	0	1	1	1	55
OTASPRequest	0	0	1	1	1	0	0	0	56
Reserved	0	0	1	1	1	0	0	1	57
ChangeFacilities	0	0	1	1	1	0	1	0	58
ChangeService	0	0	1	1	1	0	1	1	59
ParameterRequest	0	0	1	1	1	1	0	0	60
TMSIDirective	0	0	1	1	1	1	0	1	61
NumberPortabilityRequest	0	0	1	1	1	1	1	0	62
ServiceRequest	0	0	1	1	1	1	1	1	63
AnalyzedInformation	0	1	0	0	0	0	0	0	64
ConnectionFailureReport	0	1	0	0	0	0	0	1	65
ConnectResource	0	1	0	0	0	0	1	0	66
DisconnectResource	0	1	0	0	0	0	1	1	67
FacilitySelectedAndAvailable	0	1	0	0	0	1	0	0	68
InstructionRequest	0	1	0	0	0	1	0	1	69
Modify	0	1	0	0	0	1	1	0	70
ResetTimer	0	1	0	0	0	1	1	1	71
Search	0	1	0	0	1	0	0	0	72
SeizeResource	0	1	0	0	1	0	0	1	73
SRFDirective	0	1	0	0	1	0	1	0	74
TBusy	0	1	0	0	1	0	1	1	75
TNoAnswer	0	1	0	0	1	1	0	0	76
Release	0	1	0	0	1	1	0	1	77
SMSDeliveryPointToPointAck	0	1	0	0	1	1	1	0	78
MessageDirective	0	1	0	0	1	1	1	1	79

     Operation Specifiers

Operation Name	Operation Specifier								
	H	G	F	E	D	C	B	A	Decimal
Values 80-100 Reserved	x	x	x	x	x	x	x	x	80-100
InterSystemSMSPage	0	1	1	0	0	1	0	1	101
Values 102-110 Reserved									102-110
InterSystemSMSDelivery-PointToPoint	0	1	1	0	1	1	1	1	111
QualificationRequest2	0	1	1	1	0	0	0	0	112
Other Values Reserved	x	x	x	x	x	x	x	x	…
Reserved for Protocol Extension	1	1	1	0	0	0	0	0	224
				through					…
	1	1	1	1	1	1	1	1	255

1.3.1 Mapping of Operations onto TCAP Package Types

The following table lists the mapping of MAP Operations onto ANSI TCAP package types.

Table 2 Mapping of MAP Operations onto TCAP Package Types

Operation Name	Component Type	Package Type
ChangeFacilities	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
ConnectionFailure Report	INVOKE (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
ConnectResource	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
DisconnectResource	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
FacilitiesDirective	INVOKE (LAST)	QUERY WITH PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE
FacilitiesDirective2	INVOKE (LAST)	QUERY WITH PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE

Operation Name	Component Type	Package Type
InstructionRequest	INVOKE (LAST)	CONVERSATION WITH PERMISSION
	RETURN RESULT (LAST)	RESPONSE
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE
MobileOnChannel	INVOKE (LAST)	RESPONSE
RemoteUser InteractionDirective	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
ResetTimer	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN ERROR	CONVERSATION WITH PERMISSION
	REJECT	CONVERSATION WITH PERMISSION
SeizeResource	INVOKE (LAST)	QUERY WITH PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE
SMSDeliveryPoint-ToPointAck	INVOKE (LAST)	UNIDIRECTIONAL
SRFDirective	INVOKE (LAST)	CONVERSATION WITHOUT PERMISSION
	RETURN RESULT (LAST)	CONVERSATION WITH PERMISSION
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE
All other operations	INVOKE (LAST)	QUERY WITH PERMISSION
	RETURN RESULT (LAST)	RESPONSE
	RETURN ERROR	RESPONSE
	REJECT	RESPONSE

Operation Specifiers

2 OPERATION DEFINITIONS

The following table summarizes the operations defined for the MAP:

Table 3   Summary of MAP Operations

Operation	Reference
AnalyzedInformation	2.1
AuthenticationDirective	2.2
AuthenticationDirectiveForward	2.3
AuthenticationFailureReport	2.4
AuthenticationRequest	2.5
AuthenticationStatusReport	2.6
BaseStationChallenge	2.7
Blocking	2.8
BulkDeregistration	2.9
ChangeFacilities	2.10
ChangeService	2.11
ConnectionFailureReport	2.12
ConnectResource	2.13
CountRequest	2.14
DisconnectResource	2.15
FacilitiesDirective	2.16
FacilitiesDirective2	2.17
FacilitiesRelease	2.18
FacilitySelectedAndAvailable	2.19
FeatureRequest	2.20
FlashRequest	2.21
HandoffBack	2.22
HandoffBack2	2.23
HandoffMeasurementRequest	2.24
HandoffMeasurementRequest2	2.25
HandoffToThird	2.26
HandoffToThird2	2.27
InformationDirective	2.28
InformationForward	2.29
InstructionRequest	2.30
InterSystemAnswer	2.31
InterSystemPage	2.32

Table 3   Summary of MAP Operations

Operation	Reference
InterSystemPage2	2.33
InterSystemSetup	2.34
InterSystemSMSDeliveryPointToPoint	2.35
InterSystemSMSPage	2.36
LocationRequest	2.37
MessageDirective	2.38
MobileOnChannel	2.39
Modify	2.40
MSInactive	2.41
NumberPortabilityRequest	2.42
OriginationRequest	2.43
OTASPRequest	2.44
ParameterRequest	2.45
QualificationDirective	2.46
QualificationRequest	2.47
QualificationRequest2	2.48
RandomVariableRequest	2.49
RedirectionDirective	2.50
RedirectionRequest	2.51
RegistrationCancellation	2.52
RegistrationNotification	2.53
Release	2.54
RemoteUserInteractionDirective	2.55
ResetCircuit	2.56
ResetTimer	2.57
RoutingRequest	2.58
Search	2.59
SeizeResource	2.60
ServiceRequest	2.61
SMSDeliveryBackward	2.62
SMSDeliveryForward	2.63
SMSDeliveryPointToPoint	2.64
SMSDeliveryPointToPointAck	2.65

Table 3   Summary of MAP Operations

Operation	Reference
SMSNotification	2.66
SMSRequest	2.67
SRFDirective	2.68
TBusy	2.69
TMSIDirective	2.70
TNoAnswer	2.71
TransferToNumberRequest	2.72
TrunkTest	2.73
TrunkTestDisconnect	2.74
Unblocking	2.75
UnreliableRoamerDataDirective	2.76
UnsolicitedResponse	2.77

2.1   AnalyzedInformation

The AnalyzedInformation (`ANLYZD`) operation is used by the MSC to provide notification to a service logic network element (e.g., SCP, SN) that a trigger criteria at the Analyzed_Information DP has been satisfied. Service logic may then invoke a service or services. An SCP may use the AnalyzedInformation (`ANLYZD`) operation to obtain an IMS Routing address from a VCC AS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	SCP
Case 2	MSC	SN
Case 3	SCP	VCC AS

The AnalyzedInformation operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

AnalyzedInformation INVOKE Parameters			Timer: ANZT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Originating)		M	2.23	a
Digits (Dialed)		M	2.105	
MSCID (Originating)		M	2.151	b
TransactionCapability		M	2.285	
TriggerType		M	2.289	c
WINCapability		M	2.299	d
CallingPartyName		O	2.29	e
CallingPartyNumberDigits1		O	2.30	e, n
CallingPartyNumberDigits2		O	2.31	e, n
CallingPartySubaddress		O	2.34	e
ConferenceCallingIndicator		O	2.84	f
ElectronicSerialNumber		O	2.112	g
IMSI		O	2.127	g, m
LocationAreaID		O	2.135	h
MobileDirectoryNumber		O	2.139	i
MobileIdentificationNumber		O	2.140	g, m
MSCIdentificationNumber		O	2.152	j
OneTimeFeatureIndicator		O	2.167	k
PreferredLanguageIndicator		O	2.179	

RedirectingNumberDigits	O	2.198	e
RedirectingPartyName	O	2.200	e
RedirectingSubaddress	O	2.201	e
ServingCellID	O	2.225	h
SystemMyTypeCode	O	2.260	
TerminationAccessType	O	2.279	l

Notes:

a.   Include to identify the call.

b.   Include to identify the requesting MSC.

c.   Include to identify the trigger encountered.

d.   Include to identify the WIN capabilities supported.

e.   Include if available (i.e., provided in call origination).

f.   Include to indicate the number of conferees already in the call.

g.   Include if available to identify the MS.

h.   Include if available (information related to MS origination).

i.   Include if available for recording purposes (see *DMH)*.

j.   Include to identify the MSC sending the message and to indicate that the MSC is capable of accepting digits in the international format.

k.   Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

l.   Include if call involves a special access situation (e.g., *Roamer port access*).

m.   Include as the service key, if applicable.

n.   Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's Numbering Plan.

The AnalyzedInformation operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

AnalyzedInformation RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AnnouncementList		O	2.10	c
CarrierDigits		O	2.37	d
ConferenceCallingIndicator		O	2.84	e
Digits (Dialed)		O	2.105	f
DisplayText		O	2.106	d, m
DisplayText2		O	2.107	d, m
DMH_AccountCodeDigits		O	2.108	g
DMH_AlternateBillingDigits		O	2.109	g
DMH_BillingDigits		O	2.110	g
DMH_RedirectionIndicator		O	2.111	g, h
NoAnswerTime		O	2.165	i
OneTimeFeatureIndicator		O	2.167	j
RedirectingNumberDigits		O	2.198	d
RoutingDigits		O	2.209	d
TerminationList		O	2.280	l
TerminationTriggers		O	2.283	d
TriggerAddressList		O	2.286	d

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if one or more tones or announcements are to be applied to the MS.

d. Include if applicable.

e. Include to direct that ongoing call be transformed into a Conference Call.

f. Include if digits remain to be translated by the MSC.

g. Include if available for recording purposes (see *DMH*).

h. Include if redirection may apply.

      i.   Include to request an override of the Serving MSC's default *No Answer Time* value.

      j.   Include if modification to normal feature processing is required for the call in progress.

      k.   Intentionally left for future changes.

      l.   Include if call routing is required.

     m.   Include only one of these mutually exclusive parameters.

2.2 AuthenticationDirective

The AuthenticationDirective (AUTHDIR) operation is used to request modification of an MS's authentication parameters. It is also used to transport encryption parameters to the Serving MSC for CDMA OTASP, TDMA OTASP and CDMA OTAPA.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	AC	HLR
Case 2	HLR	Serving VLR
Case 3	Serving VLR	Serving MSC

The AuthenticationDirective operation allows one or more of several possible authentication processes to be initiated, including:

1. An update of SharedSecretData (SSD) when SSD is shared.
2. An update of SSD when SSD is not shared.
3. An update of the CallHistoryCount (COUNT) parameter value.
4. A Unique Challenge when SSD is shared (i.e., VLR-initiated).
5. A Unique Challenge when SSD is not shared (i.e., AC-initiated).
6. Revocation of SSD sharing.
7. OTA reauthentication.

The AuthenticationDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

AuthenticationDirective INVOKE Parameters			Timer: ADT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	o, l
AuthenticationAlgorithmVersion		O	2.11	a
AuthenticationResponseReauthentication		O	2.16	q
AuthenticationResponseUniqueChallenge		O	2.17	b
CallHistoryCount		O	2.26	c
CarrierDigits		O	2.37	r
CaveKey		O	2.38	p
CDMAPrivateLongCodeMask		O	2.61	m
DenyAccess		O	2.100	d
DestinationDigits		O	2.103	r
LocationAreaID		O	2.135	e

MobileStationMIN	O	2.142	j
MSCID	O	2.151	n
RandomVariableReauthentication	O	2.191	q
RandomVariableSSD	O	2.192	f
RandomVariableUniqueChallenge	O	2.193	b
RoutingDigits	O	2.209	r
SenderIdentificationNumber	O	2.215	g
ServiceIndicator	O	2.221	k
SharedSecretData	O	2.227	c
SignalingMessageEncryptionKey	O	2.228	m
SSDNotShared	O	2.253	h
UpdateCount	O	2.292	i
VoicePrivacyMask	O	2.297	m

Notes:

a.   May be included if SharedSecretData parameter is included.

b.   Include if the Serving MSC shall initiate a Unique Challenge to the MS.

c.   Include if the SystemCapabilities include *CAVE Execution* and AC administration policies allow distribution of the SSD.

d.   Include if release of system resources allocated for this access may be initiated by the MSC. This may include disconnection of any call in progress.

e.   May be included from VLR to Serving MSC. Usage from the HLR or AC is not defined.

f.   Include if the Serving MSC shall initiate an SSD update to the MS.

g.   May be included to identify the functional entity sending this message.

h.   Include if the SSD at the VLR shall be discarded.

i.   Include if the Serving MSC shall initiate a COUNT Update to the MS.

j.   Include for CDMA OTASP to indicate the MIN value currently in the MS's permanent memory, for backward compatibility with IS-725, (Not included for CDMA OTAPA).

k.   Include for CDMA and TDMA OTASP and CDMA OTAPA.

l.   For CDMA OTASP, contains the Activation_MIN. For CDMA OTAPA, contains the MS's MSID at the start of the OTAPA session.

m.   Include to transport encryption parameters to the Serving MSC.

n.   Include for CDMA OTASP (but not for CDMA OTAPA) to identify Serving System. This parameter is not included when AuthenticationDirective INVOKE is sent from the VLR to the Serving MSC.

o. The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System; otherwise the HLR includes the MobileIdentificationNumber type of MSID. This may not be the type of MSID received from the AC. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received from the HLR.

p. Include for TDMA OTASP to transport TDMA Enhanced Privacy and Encryption parameters to the Serving MSC.

q. Include if the Serving MSC shall initiate Reauthentication of the MS.

r. Include if authentication failed and the AC/HLR determines the call should be redirected. These parameters may be included if the DenyAccess parameter is present.

The AuthenticationDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows.

AuthenticationDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CallHistoryCount		O	2.26	a

Notes:

a. Include if available at the VLR.

2.3 AuthenticationDirectiveForward

The AuthenticationDirectiveForward (AUTHDIRFWD) operation is sent from the Anchor MSC toward the Serving MSC to request initiation of one or more authentication processes for the indicated MS.This operation can be relayed through the Tandem MSC(s).

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Serving MSC
Case 2	Anchor MSC	Tandem MSC
Case 3	Tandem MSC	Serving MSC

The AuthenticationDirectiveForward operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

AuthenticationDirectiveForward INVOKE Parameters				Timer: ADFT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
AuthenticationResponseUniqueChallenge		O	2.17	a
IMSI		O	2.127	c
MobileIdentificationNumber		O	2.140	c
RandomVariableUniqueChallenge		O	2.193	a
UpdateCount		O	2.292	b

Notes:

a. Include if the Serving MSC shall initiate a Unique Challenge to the indicated MS.

b. Include if the Serving MSC shall initiate a COUNT Update to the MS.

c. Include if available. At least one of these parameters shall be present.

The AuthenticationDirectiveForward operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

AuthenticationDirectiveForward RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CountUpdateReport		O	2.88	a
UniqueChallengeReport		O	2.291	b

Notes:

a. Include to report outcome related to COUNT Update.

b. Include to report outcome related to Unique Challenge.

2.4 AuthenticationFailureReport

The AuthenticationFailureReport (AFREPORT) operation is used to report on the failure of an autonomously initiated authentication operation for an MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR
Case 3	HLR	AC

The AuthenticationFailureReport operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

AuthenticationFailureReport INVOKE Parameters			Timer: AFRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	e, f
ReportType		M	2.204	
SystemAccessType		M	2.258	
SystemCapabilities (Serving)		M	2.259	
CallHistoryCount		O	2.26	a
CallHistoryCountExpected		O	2.27	a
MSCID (Serving MSC)		O	2.151	b
SenderIdentificationNumber		O	2.215	d
TerminalType		O	2.278	g

Notes:

    a.   Include if ReportType parameter value is *COUNT mismatch*.

    b.   Should be included on *IS-41-C* or later.

    c.   Intentionally left for future modifications.

    d.   May be included to identify the functional entity sending the message.

    e.   Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

    f.   The HLR may replace the IMSI parameter, if received, by the MobileIdentificationNumber parameter before forwarding this message to the AC.

    g.   May be included if received from the MS.

The AuthenticationFailureReport operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows.

AuthenticationFailureReport RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AuthenticationAlgorithmVersion		O	2.11	a
AuthenticationResponseUniqueChallenge		O	2.17	b
CallHistoryCount		O	2.26	c
CarrierDigits		O	2.37	j
DenyAccess		O	2.100	d
DestinationDigits		O	2.103	j
MobileIdentificationNumber		O	2.140	i
RandomVariableSSD		O	2.192	e
RandomVariableUniqueChallenge		O	2.193	b
RoutingDigits		O	2.209	j
SharedSecretData		O	2.227	c
SSDNotShared		O	2.253	f
TerminalType		O	2.278	g
UpdateCount		O	2.292	h

Notes:

a.   May be included if the SharedSecretData parameter is included.

b.   Include if the MSC-V shall initiate a Unique Challenge to the MS.

c.   Include if the SystemCapabilities include *CAVE execution* and AC administration policies allow distribution of the SSD.

d.   Include if the MSC may initiate a release of system resources allocated for this access. This may include disconnection of any call in progress.

e.   Include if the MSC-V shall initiate an SSD update to the MS.

f.   Include if the VLR shall discard the SSD.

g.   Include the value provisioned for this subscription on *IS-41-C* or later.

h.   Include if the MSC-V shall initiate a COUNT Update to the MS.

i.   Include if:

-    SSD or pending SSD is shared,

-    MIN is needed for authentication calculations, and

-    MIN was not present as the MSID in the corresponding INVOKE.

j.   Include if authentication failed and the AC/HLR determines the call should be redirected. These parameters may be included if the DenyAccess parameter is present.

2.5 AuthenticationRequest

The AuthenticationRequest (`AUTHREQ`) operation is used to request authentication of an authentication-capable MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR
Case 3	HLR	AC

Authentication may be initiated under various circumstances including:

1. When the MS is informed that authentication is required on system accesses and:
   - the MS attempts initial registration,
   - the MS attempts call origination,
   - the MS attempts call termination,
   - the MS issues an in-call flash request,
   - the MS re-registers, or
   - the MS issues an in-call flash request while global challenge is not in use.
2. When the MS is informed that authentication is not required on system accesses and the MS attempts an initial system access (e.g., registration, origination, page response).

Also, the AuthenticationRequest operation may vary depending on whether SSD is shared or not. Note that the AuthenticationRequest (`AUTHREQ`) operation may result in a Network Directed System Selection (NDSS) procedure.

The AuthenticationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows.

AuthenticationRequest INVOKE Parameters			Timer: ART	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSCID (Serving MSC)		M	2.151	
MSID		M	2.153	k, l
SystemAccessType		M	2.258	
SystemCapabilities (Serving)		M	2.259	
AuthenticationData		O	2.13	a
AuthenticationResponse		O	2.14	c
CallHistoryCount		O	2.26	c
CDMANetworkIdentification (Serving MSC)		O	2.57	m

ConfidentialityModes (Actual)	O	2.85	e
ControlChannelMode	O	2.87	n
Digits (Dialed)	O	2.105	g
PC_SSN (Serving MSC or VLR or HLR)	O	2.176	h
RandomVariable	O	2.189	c
SenderIdentificationNumber	O	2.215	i
ServiceRedirectionCause	O	2.222	o
SuspiciousAccess	O	2.256	q
TerminalType	O	2.278	j
TransactionCapability	O	2.285	p

Notes:

a. Include if the authentication data input to the authentication signature calculation procedures cannot be derived from other parameters (e.g., the SystemAccessType parameter value is set to Call origination and the air interface encoding of dialed digits is not TBCD).

b. This entry intentionally left blank.

c. Include if authentication parameters were requested and received on this system access.

d. This entry intentionally left blank.

e. Include if the SystemAccessType value is Flash Request and Signaling Message Encryption is not active.

f. This entry intentionally left blank.

g. Include if the SystemAccessType value is Call Origination or Flash Request.

h. Include to override lower layer addressing if the receiving VLR, HLR, or AC is known to be in the same national SS7 network. If included, it identifies the functional entity sending the message.

i. May be included to identify the functional entity sending the message.

j. Should be included on *IS-41-C* or later.

k. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

l. The HLR may replace the IMSI parameter, if received, by the MobileIdentificationNumber parameter before forwarding this message to the AC.

m. Include for NDSS to identify the serving network.

n. Include for NDSS to identify the operating mode of the MS.

o. Include for NDSS to indicate reason of MS registration or access.

p. Include if system is NDSS capable.

q. Include if the access is suspicious, (e.g., if the access contains anomalous information such as (extraneous digits).

The AuthenticationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

AuthenticationRequest RETURN RESULT Parameters				
Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AnalogRedirectRecord		O	2.8	j
AuthenticationAlgorithmVersion		O	2.11	a
AuthenticationFailureEvent		O	2.14	r
AuthenticationResponseUniqueChallenge		O	2.17	b
CallHistoryCount		O	2.26	c
CarrierDigits		O	2.37	o
CaveKey		O	2.38	d, p
CDMAPrivateLongCodeMask		O	2.61	d
CDMARedirectRecord		O	2.62	k
DataKey		O	2.93	q
DenyAccess		O	2.100	e
DestinationDigits		O	2.103	o
MobileIdentificationNumber		O	2.140	l
RoamingIndication		O	2.208	m
ServiceRedirectionInfo		O	2.223	j, k
RandomVariableSSD		O	2.192	f
RandomVariableUniqueChallenge		O	2.193	b
RoutingDigits		O	2.209	o
SharedSecretData		O	2.227	c
SignalingMessageEncryptionKey		O	2.228	g, n, p
SSDNotShared		O	2.253	h
UpdateCount		O	2.292	i
VoicePrivacyMask		O	2.297	d, n

Notes:

a. May be included if the SharedSecretData parameter is included.

b. Include if the Serving MSC shall initiate a Unique Challenge to the MS.

c. Include if the SystemCapabilities include CAVE Execution and AC administration policies allow distribution of the SSD.

d. Include if appropriate and the SystemAccessType value is Call Origination or Page Response.

e.   Include if the MSC may initiate a release of system resources allocated for this access. This may include disconnection of any call in progress.

f.   Include if the Serving MSC shall initiate an SSD update.

g.   Include if the SystemAccessType value is Call Origination or Page Response.

h.   Include if the VLR shall discard the SSD.

i.   Include if the Serving MSC should initiate COUNT Update to the MS.

j.   Include for NDSS if HLR is to redirect the MS to an analog system.

k.   Include for NDSS if HLR is to redirect the MS to a CDMA system.

l.   Include if:

   -   SSD or pending SSD is shared,

   -   MIN is needed for authentication calculations, and

   -   MIN was not present as the MSID in the corresponding INVOKE.

m.   Include for CDMA to support Enhanced Roaming Indicator.

n.   Include if the SystemAccessType is set to Autonomous Registration and the MS Terminal Type requires this parameter (e.g., PACS).

o.   Include if authentication failed and the AC/HLR determines the call should be redirected. These parameters may be included if the DenyAccess parameter is present.

p.   Include if appropriate and the received SystemAccessType value is Autonomous registration.

q.   Include if applicable (e.g., MS is able to make data calls).

r.   This parameter is used by the AC to inform the VLR of a failed authentication event without denying access for the call.

2.6 AuthenticationStatusReport

The AuthenticationStatusReport (ASREPORT) operation is used to report on the outcome of an authentication operation initiated by the AC or VLR if SSD is shared.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR
Case 3	HLR	AC

The AuthenticationStatusReport operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

AuthenticationStatusReport INVOKE Parameters				Timer: ASRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	k, l, f
SystemCapabilities (Serving)		M	2.259	
CountUpdateReport		O	2.88	a
EnhancedPrivacyEncryptionReport		O	2.114	m
MSCID (Serving)		O	2.151	i
ReauthenticationReport		O	2.196	j
SenderIdentificationNumber		O	2.215	b
ServiceIndicator		O	2.221	e
SignalingMessageEncryptionReport		O	2.229	h
SSDUpdateReport		O	2.254	c
UniqueChallengeReport		O	2.291	d
VoicePrivacyReport		O	2.298	g

Notes:

a.   Include if report related to COUNT Update.

b.   Include to identify the functional entity sending the message.

c.   Include if report related to SSD Update.

d.   Include if report related to Unique Challenge.

e.   Include for OTASP (CDMAand TDMA) and CDMA OTAPA.

f. For CDMA OTASP, contains the Activation_MIN. For CDMA OTAPA contains the MS's MSID at the start of the OTAPA session.

g. Include to indicate the result of attempting to activate voice privacy on the air-interface following MS Reauthentication during a CDMA or TDMA OTASP session or a CDMA OTAPA session.

h. Include to indicate the result of attempting to activate signaling message encryption on the air-interface following MS Reauthentication during a CDMA or TDMA OTASP session or a CDMA OTAPA session.

i. Include to identify the Serving MSC.

j. Include if report related to TDMA Reauthentication.

k. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

l. The HLR may replace the IMSI parameter, if received, by the MobileIdentificationNumber paramter before forwarding this message to the AC.

m. Include if report related to TDMA Enhanced Privacy and Encryption.

The AuthenticationStatusReport operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

AuthenticationStatusReport RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AuthenticationAlgorithmVersion		O	2.11	a
AuthenticationResponseUniqueChallenge		O	2.17	b
CallHistoryCount		O	2.26	c
CarrierDigits		O	2.37	h
DenyAccess		O	2.100	d
DestinationDigits		O	2.103	h
MobileIdentificationNumber		O	2.140	i
RandomVariableSSD		O	2.192	e
RandomVariableUniqueChallenge		O	2.193	b
RoutingDigits		O	2.209	h
SharedSecretData		O	2.227	c
SSDNotShared		O	2.253	f
UpdateCount		O	2.292	g

Notes:

a. May be included if the SharedSecretData parameter is included.

b.   Include if the Serving MSC shall initiate a Unique Challenge to the MS.

c.   Include if the SystemCapabilities include *CAVE Execution* and AC administration policies allow distribution of the SSD.

d.   Include if the MSC may initiate a release of system resources allocated for this access. This may include disconnection of any call in progress.

e.   Include if the Serving MSC shall initiate an SSD update to the MS.

f.   Include if the VLR shall discard the SSD.

g.   Include if the Serving MSC shall initiate a COUNT Update to the MS.

h.   Include if authentication failed and the AC/HLR determines the call should be redirected. These parameters may be included if the DenyAccess parameter is present.

i.   Include if:

  -    SSD or pending SSD is shared.

  -    MIN is needed for authentication calculations, and

  -    MIN was not present as the MSID in the corresponding INVOKE.

2.7 BaseStationChallenge

The BaseStationChallenge (BSCHALL) operation is used to request a response to a Base Station Challenge Order received from an MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR
Case 3	HLR	AC

The BaseStationChallenge operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

BaseStationChallenge INVOKE Parameters			Timer: BSCT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	c, d, e
RandomVariableBaseStation		M	2.190	
SenderIdentificationNumber		O	2.215	a
ServiceIndicator		O	2.221	b

Notes:

a.   Include to identify the functional entity sending the message.

b.   Include for CDMA OTASP or CDMA OTAPA.

c.   For CDMA OTASP, contains the Activation_MIN. For CDMA OTAPA contains the MS's MSID at the start of the OTAPA session.

d.   Include the identifier with which the MS last accessed the system unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

e.   The HLR may replace the IMSI parameter by the MobileIdentificationNumber parameter before forwarding this message to the AC.

The BaseStationChallenge operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

BaseStationChallenge RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AuthenticationResponseBaseStation		M	2.15	

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2.8   Blocking

The Blocking (`BLOCKING`) operation is used to inform an MSC that the designated circuit has been removed from service.

The following table lists the possible combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The Blocking operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Blocking INVOKE Parameters				Timer: BLKT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
InterMSCCircuitID		M	2.129		

The Blocking operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. This parameter Set is encoded as follows:

Blocking RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.9   BulkDeregistration

This BulkDeregistration (BULKDEREG) operation is used by a VLR to inform the HLR that all MS data associated with the HLR has been removed from the VLR.

The following table lists the valid combinations of invoking and responding FEs

	INVOKING FE	RESPONDING FE
Case 1	Serving VLR	HLR

The BulkDeregistration operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

BulkDeregistration INVOKE Parameters				Timer: BDT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
SenderIdentificationNumber		M	2.215	

TheBulkDeregistration operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

BulkDeregistration RETURN RESULT Parameters					
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.10   ChangeFacilities

The ChangeFacilities (`CHGFAC`) operation is used to connect appropriate facilities at each MSC, on the forward handoff chain in order to effect in-call service change. This operation is invoked from the Anchor MSC only if a change of facilities is needed and facilities have not been reserved. This operation is not needed in the multiple vocoder case.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC/IWF	Serving MSC
Case 2	Anchor MSC/IWF	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Serving MSC

One of the following results is returned:

1.   Notification that the appropriate facilities, were successfully connected at each MSC on the forward handoff chain, and existing facilities were released.

2.   Notification that needed facilities were not allocated at an MSC on the forward handoff chain. In this case, existing facilities were left intact in order to continue supporting the current service.

The ChangeFacilities operation is initiated with a TCAP INVOKE(LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

ChangeFacilities INVOKE Parameters			Timer: CFT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
CDMAPrivateLongCodeMask		O	2.61	f
CDMAServiceConfigurationRecord		O	2.65	b
DataKey		O	2.93	f
DataPrivacyParameters		O	2.94	i, f
ElectronicSerialNumber		O	2.112	c
InterMSCCircuitID		O	2.129	a, c
IMSI		O	2.127	j
ISLPInformation		O	2.132	d
MobileIdentificationNumber		O	2.140	j
RandomVariable		O	2.189	f
SecondInterMSCCircuitID		O	2.213	c, g
TDMABandwidth		O	2.267	h

TDMAServiceCode	O	2.273	e	
VoicePrivacyMask	O	2.297	f	

Notes:

a. Include to indicate the InterMSCCircuitID of the existing service. Always include.

b. Include appropriate CDMA records that describe the granted service.

c. Include to identify the existing call.

d. Include appropriate ISLP Information, if needed, for circuit-mode (e.g., ADS, G3 Fax) services. If excluded for circuit mode data calls, interpret as *ISLP supported*.

e. Include appropriate TDMA parameters that describe the granted service.

f. Include appropriate privacy parameters for the granted service, if available and if allowed for the user.

g. Include to indicate the InterMSCCircuitID of the new circuit required to support the new service.

h. Include appropriate TDMA parameters that describe the granted service. If omitted, assume to be *Full-rate Digital Traffic Channel* value.

i. Do not include if previously sent in a handoff invoke message (e.g., FacilitiesDirective2, HandoffBack2, or HandofftoThird2).

j. Include if available. At least one of these parameters should be present.

The ChangeFacilities operation success is reported with a TCAP RETURN RESULT(LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

ChangeFacilities RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ReasonList		O	2.195	a

Notes:

a. Include to identify the reason(s) for change request failure (e.g., service not allowed).

2.11   ChangeService

The ChangeService (CHGSERV) operation is used by the Serving MSC to request the Anchor MSC to grant an MS its Service Change Request that came as a result of either an initial request or as a result of a negotiated In Call Service Change request between the Serving MSC and the MS.

ChangeService only supports the ability to change a single service. It does not support multiple service scenarios.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Anchor MSC/IWF
Case 2	Serving MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Anchor MSC/IWF

The following results are possible:

1. A notification that the requested service, which could be the initial requested service or a negotiated service arrived at using an earlier invocation of the CHGSERV operation, was granted.

2. A notification that the in-call service change request was unsuccessful, and the associated reason(s) for the failure are returned. The unsuccessful case occurs because the requested service is not allowed for the user or cannot be supported at all MSCs on the forward handoff chain.

3. A substitute allowed or preferred service (or a list of services, possibly ranked) to be used for service negotiation with the MS is returned to the Serving MSC because the requested service is not allowed or cannot be supported at all MSCs on the forward handoff chain.

The ChangeService operation is initiated with a TCAP INVOKE(LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

ChangeService INVOKE Parameters				Timer: CST
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
CDMAServiceConfigurationRecord		O	2.65	a
CDMAServiceOptionList		O	2.67	b
ChangeServiceAttributes		O	2.80	c
ElectronicSerialNumber		O	2.112	d
InterMSCCircuitID		O	2.129	j
IMSI		O	2.127	k
ISLPInformation		O	2.132	e
MobileIdentificationNumber		O	2.140	k

TDMABandwidth	O	2.267	g
TDMADataMode	O	2.272	i
TDMAServiceCode	O	2.273	f
TDMAVoiceMode	O	2.276	h

Notes:

a. Include appropriate CDMA service configuration information that describes the requested service.

b. Include, if available, to indicate additional services (for service negotiation) related to the requested service. Services not supported by the tandem MSC and Anchor MSC will be filtered.

c. Include to indicate attributes describing the nature of the service change request. This parameter indicates whether or not a ChangeFacilities operation is necessary to reserve and activate the facilities required for the requested service. This parameter indicates whether or not this operation is executed after successful Service Negotiation between the Serving MSC and the MS.

d. Include if appropriate.

e. Include if applicable for circuit-mode (e.g., ADS, G3Fax) services. If excluded for circuit mode data calls, interpret as *ISLP supported*.

f. Include appropriate TDMA parameters that describe the requested service.

g. Include appropriate TDMA parameters that describe the requested service. If omitted, assume to be *Full-rate Digital Traffic Channel*.

h. Include for a requested service change to voice mode.

i. Include for a requested service change to data or fax mode.

j. Include to indicate the InterMSCCircuitID of the existing service. Always include.

k. Include if available. At least one of these parameters should be present.

The ChangeService operation success is reported with a TCAP RETURN RESULT(LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

ChangeService RETURN RESULT Parameters

Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CDMAPrivateLongCodeMask		O	2.61	f
CDMAServiceConfigurationRecord		O	2.65	b
CDMAServiceOptionList		O	2.67	c
ChangeServiceAttributes		O	2.80	d
DataKey		O	2.93	f
DataPrivacyParameters		O	2.94	g, f
RandomVariable		O	2.189	f
ReasonList		O	2.195	a
TDMAServiceCode		O	2.273	e
VoicePrivacyMask		O	2.297	f

Notes:

a. Include to list the reasons for change request failure.

b. Include appropriate CDMA service configuration information that describes the granted service or a substitute service.

c. Include to indicate the authorized service options for service negotiation. Services not supported by the Anchor MSC and Tandem MSC shall be filtered.

d. Include to indicate whether or not the use of new facilities and the removal of old facilities was accomplished with the execution of a ChangeFacilities operation.

e. Include to describe the granted service for TDMA systems, or include to indicate that the requested service was denied.

f. Include privacy parameters for the granted service, if available and if allowed for the user.

g. Do not include if previously sent in a handoff invoke message (e.g., FacilitiesDirective2, HandoffBack2, or HandofftoThird2).

2.12   ConnectionFailureReport

The ConnectionFailureReport (`CONNFAILRPT`) operation is used by the MSC to report to a service logic network element the failure of a connection to an IP or SN.

The following table lists the valid invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	HLR or SCP or SN
Case 2	HLR	SCP or SN
Case 3	SCP or SN	HLR or SCP or SN

The ConnectionFailureReport operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

ConnectionFailureReport INVOKE Parameters				Timer: CFRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
FailureType		M	2.119	
FailureCause		O	2.118	a

Notes:

   a.   Include if the ISUP Cause Indicator is available.

2.13   ConnectResource

The ConnectResource (`CONNRES`) operation is used by a Service Control Function (SCF) to request the establishment of a connection between a Service Switching Function (SSF) and a Specialized Resource Function (SRF) when the SCF determines that a specialized resource is needed for service logic execution.

The following table lists the valid invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR or SCP or SN	MSC
Case 2	HLR	SCP or SN
Case 3	SCP or SN	HLR or SCP or SN

The ConnectResource operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

ConnectResource INVOKE Parameters				Timer: (note a)	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
DestinationDigits		M	2.103		
CarrierDigits		O	2.37	b	
RoutingDigits		O	2.209	b	

Notes:

a. The SCF starts the WIN Response Timer (WINRT) awaiting an InstructionRequest INVOKE from the SRF. The SCF also starts the Reset Timer (REST). When the ResetTimer expires, the SCF sends a ResetTimer INVOKE toward the SSF (i.e., MSC) to initialize and start the Service Switching Function Timer (SSFT).
When an intervening SCF receives the ConnectResource INVOKE, it stops the Service Request Timer (SVRT), sends a ConnectResource INVOKE to the requesting SSF, and starts the Service Control Function Timer (SCFT).

b. Include if applicable.

2.14 CountRequest

The CountRequest (`COUNTREQ`) operation is used to obtain the current value of the CallHistoryCount parameter.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	AC	HLR
Case 2	HLR	Old Serving VLR

The CountRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

CountRequest INVOKE Parameters				Timer: CRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	b
SenderIdentificationNumber		O	2.215	a

Notes:

a. Include to identify the functional entity sending the message.

b. The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Old Serving System; othewise the HLR includes the MobileIdentificationNumber type of MSID. This may not be the type of MSID received from the AC.

The CountRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

CountRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CallHistoryCount		O	2.26	a

Notes:

a. Include if CallHistoryCount was maintained by the VLR.

2.15   DisconnectResource

The DisconnectResource (`DISCONNRES`) operation is used by the SCF to instruct the SSF to release a connection established between the SSF and an SRF when the SCF determines that this connection should be released. This operation is normally applicable after a ConnectResource operation.

The following table lists the valid invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR or SCP or SN	MSC
Case 2	HLR	SCP or SN
Case 3	SCP or SN	HLR or SCP or SN

The DisconnectResource operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

DisconnectResource INVOKE Parameters				Timer: (note a)
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				

Notes:

    a.   When the SSF receives the DisconnectResource; INVOKE, it stops the Service Switching Function Timer (SSFT) and initializes and starts the operation timer that was stopped when the ConnectResource INVOKE was received.

           When an intervening SCF receives the DisconnectResource INVOKE, it stops the Service Control Function Timer (SCFT), sends a DisconnectResource INVOKE to the requesting SSF, and initializes and starts the Service Request Timer (SVRT) that was stopped when the ConnectResource INVOKE was received.

2.16 FacilitiesDirective

The FacilitiesDirective (FACDIR) operation is used to request that the Target MSC initiate the Handoff-Forward task.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Target MSC
Case 2	Serving MSC	Target MSC
Case 3	Tandem MSC	Target MSC

One of two possible results is returned:

1. Notification that the request was accepted, including the parameters of the voice channel selected by the Target MSC on the designated cell.
2. Notification that the request was unsuccessful because a voice channel on the designated cell is not available.

The FacilitiesDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitiesDirective INVOKE Parameters			Timer: HOT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Anchor MSC)		M	2.23	i
ChannelData (Serving)		M	2.81	a
ElectronicSerialNumber		M	2.112	
InterMSCCircuitID		M	2.129	
InterSwitchCount		M	2.130	
MobileIdentificationNumber		M	2.140	
ServingCellID		M	2.225	
StationClassMark		M	2.255	
TargetCellID		M	2.263	
ConfidentialityModes (Desired)		O	2.85	b
HandoffReason		O	2.125	c
HandoffState		O	2.126	d
SignalingMessageEncryptionKey		O	2.228	e
TDMABurstIndicator (Serving)		O	2.268	f
TDMACallMode		O	2.269	g
TDMAChannelData (Serving)		O	2.270	f

VoicePrivacyMask	O	2.297	h

Notes:

a.   This parameter has a length of 0 if a TDMA channel is in use.

b.   Include if MS supports Signaling Message Encryption or Voice Privacy. The parameter shall be carried forward in any subsequent handoff.

c.   Include if known.

d.   Include if call is still in the awaiting answer or alerting state.

e.   Include if Signaling Message Encryption may apply. The parameter shall be carried forward in any subsequent handoff.

f.   Include if a TDMA channel is in use.

g.   Include to indicate the acceptable call mode.

h.   Include if the Voice Privacy may apply. The parameter shall be carried forward in any subsequent handoff.

i.   The first six octets are assigned by the Anchor MSC but the segment counter is modified as the call is handed off.

The FacilitiesDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitiesDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ChannelData (Target)		M	2.81	a
ConfidentialityModes (Actual)		O	2.85	b
TDMABurstIndicator (Target)		O	2.268	c
TDMAChannelData (Target)		O	2.270	d

Notes:

a.   This parameter has a length of 0 if a TDMA channel has been assigned.

b.   Include if ConfidentialityModes was requested to reflect actual assignment.

c.   May be included if a TDMA channel has been assigned.

d.   Include if a TDMA channel has been assigned.

2.17   FacilitiesDirective2

The FacilitiesDirective2 (FACDIR2) operation is used to request that the Target MSC initiate the Handoff-Forward task. This operation differs from the FacilitiesDirective operation in its addition of support for CDMA, multi-band TDMA, and NAMPS MSs.

The following table lists the valid combinations of invoking and responding NEs.

	INVOKING NE	RESPONDING NE
Case 1	Anchor MSC	Target MSC
Case 2	Serving MSC	Target MSC
Case 3	Tandem MSC	Target MSC

One of two possible results is returned:

1.   Notification that the request was accepted, including the parameters of the voice channel selected by the Target MSC on the designated cell.

2.   Notification that the request was unsuccessful because a voice channel on the designated cell is not available.

The FacilitiesDirective2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitiesDirective2 INVOKE Parameters				Timer: HOT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
BillingID (Anchor MSC)		M	2.23	a	
ElectronicSerialNumber		M	2.112		
InterMSCCircuitID		M	2.129		
InterSwitchCount		M	2.130		
ServingCellID		M	2.225	b	
AlertCode		O	2.4	c	
BaseStationManufacturerCode		O	2.21	d	
CaveKey		O	2.38	e	
CDMA2000HandoffInvokeIOSData		O	2.39	f	
CDMABandClassList		O	2.44	g	
CDMACallMode		O	2.45	h, i, j	
CDMAChannelData (Serving)		O	2.46	k, av	
CDMAConnectionReferenceList		O	2.54	[h], l, m	
CDMAMobileProtocolRevision		O	2.55	[h], n	

CDMAMSMeasuredChannelIdentity	O	2.56	o
CDMAPrivateLongCodeMask	O	2.61	p
CDMAServiceConfigurationRecord	O	2.65	h, q, r
CDMAServiceOptionList	O	2.67	h, s
CDMAServingOneWayDelay	O	2.68	b, h
CDMAStationClassMark	O	2.72	h, n, t, u
CDMAStationClassMark2	O	2.73	h, n
CDMATargetMAHOList	O	2.75	v
CDMATargetMeasurementList	O	2.77	w
ChannelData (Serving)	O	2.81	x
ConfidentialityModes (Desired)	O	2.85	y
DataKey	O	2.93	m
DataPrivacyParameters	O	2.94	z
HandoffReason	O	2.125	aa
HandoffState	O	2.126	ab
IMSI	O	2.127	ac
ISLPInformation (Desired)	O	2.132	ad
MobileIdentificationNumber	O	2.140	ac
MSLocation	O	2.155	h
NAMPSCallMode	O	2.156	j, ae
NAMPSChannelData (Serving)	O	2.157	af
NonPublicData	O	2.166	ag
RandomVariable	O	2.189	m
SignalingMessageEncryptionKey	O	2.228	ah
SpecialHandling	O	2.249	ai
StationClassMark	O	2.255	x, aj, ak
SystemOperatorCode	O	2.261	al
TargetCellID	O	2.263	am
TDMABandwidth (Desired)	O	2.267	an
TDMABurstIndicator (Serving)	O	2.268	aj
TDMACallMode	O	2.269	j, ao, aj
TDMAChannelData (Serving)	O	2.270	aj

TDMAServiceCode	O	2.273	ap, aq
TDMATerminalCapability	O	2.274	aq
TDMAVoiceCoder	O	2.275	ar
TerminalType	O	2.278	as
UserZoneData	O	2.294	at
VoicePrivacyMask	O	2.297	au

Notes:

a. The first six octets are assigned by the Anchor MSC but the segment counter is modified as the call is handed off.

b. For CDMA, the ServingCellID and CDMAServingOneWayDelay parameters correspond to the active set member having the shortest signal path to the MS (time reference cell).

c. Include if the MS is alerting to specify special alerting treatment.

d. Include if the MS is *IS-136* or later and BSMC-specific signaling is supported.

e. Include if available and TDMA Enhanced Privacy and Encryption apply. This parameter shall be carried forward in subsequent handoffs.

f. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 IOS handoff invoke information (e.g., IS-2000 Channel Identity, IS-2000 Service Configuration Record, IS-2000 Mobile Capabilities, [see *IOS*]).

g. Include to indicate band classes and band subclasses supported by the MS.

h. Include if CDMA handoff.

i. Include to indicate the acceptable call mode if other than AMPS (i.e., CDMA or NAMPS).

j. The values in these parameters shall not contain conflicting information.

k. The Long Code Mask field should be set to the long code mask in use at the Serving MSC.

l. Include to indicate state information for the requested service option(s) connection reference.

m. Include for CDMA data privacy, if applicable and if authorized for the user.

n. Include to indicate information for the current band in use.

o. Include to indicate the band class and frequency that has been measured by the MS in preparation for hard handoff.

p. This parameter shall be provided if the MS supports CDMA and is authorized to have Voice Privacy and the CDMAPrivateLongCodeMask parameter is available.

q. Include to indicate a requested service configuration other than the one agreed upon by the Serving and Target Systems.

r. Include if the Serving MSC, the Target MSC, or both support only an A-Interface prior to IOS version 4.1.

s. Include to indicate the authorized service options.

t. Include if an 800 MHz CDMA channel is in use for an IS-41-C system.

u. Ignore on reception if the CDMAStationClassMark2 is also received and recognized.

v. Include for either the CDMA MAHO case or the CDMA forced handoff case.

w. Include for the CDMA non-MAHO case.

x. Include if an AMPS or NAMPS channel is in use.

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y. Include if MS supports Signaling Message Encryption, Voice Privacy, Data Privacy, or TDMA Enhanced Privacy and Encryption. This parameter shall be carried forward in subsequent handoffs.

z. Include to indicate last known value of DP Data field. Do not include if contained in the CDMAConnectionReferenceList parameter.

aa. Include if known.

ab. Include if call is in the awaiting answer or alerting state.

ac. Include if available. At least one of these parameters should be present.

ad. Include appropriate ISLP information, if needed for circuit mode (e.g., ADS, G3Fax) services. If not included for circuit mode data calls, interpret as ISLP supported.

ae. Include to indicate the acceptable call mode if other than AMPS (i.e., NAMPS).

af. Include if an NAMPS channel is in use.

ag. Include to provide information regarding Non-Public Information Display (e.g., User Zone updates) at the target system.

ah. Include if MS supports Signaling Message Encryption, Voice Privacy or Data Privacy. This parameter shall be carried forward in subsequent handoffs.

ai. Include if any fields in this parameter are non-zero.

aj. Include if a TDMA channel is in use.

ak. Include if the CDMA MS supports 800 MHz analog operation and the target system does not support CDMA.

al. Include if the MS is IS-136 or later and SOC-specific signaling is supported.

am. Include if an AMPS, NAMPS, or a TDMA handoff.

an. Include to describe the requested TDMA traffic channel. If omitted for data calls, assume to be Full-rate Digital Traffic Channel only.

ao. Include to indicate the acceptable call mode.

ap. Include to indicate the requested TDMA service information.

aq. Include if MS is TDMA *IS-136* or later.

ar. Include to indicate subscriber or network preferences for Voice Coder selection when multiple voice coders exist. If not included, or if preferences cannot be supported, the receiving system will select Voice Coder based on Terminal Capability.

as. Include for statistical purposes.

at. Include if the MS user is authorized for User Zone Service. Include to permit the Target MSC to validate MS selection of User Zone.

au. This parameter shall be provided if the MS supports TDMA and is authorized to have Voice Privacy and the VoicePrivacyMask parameter is available.

av. Include for CDMA handoff, if available.

The FacilitiesDirective2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitiesDirective2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
BSMCStatus		O	2.25	a
CDMA2000HandoffResponseIOSData		O	2.40	b
CDMAChannelData (Target)		O	2.46	c, d
CDMACodeChannelList		O	2.51	c, e
CDMAConnectionReferenceList		O	2.54	c, f, g
CDMASearchParameters		O	2.63	c, h
CDMASearchWindow		O	2.64	c, i
CDMAServiceConfigurationRecord		O	2.65	c, j, k
ChannelData (Target)		O	2.81	l, m
ConfidentialityModes (Actual)		O	2.85	n
ISLPInformation (Actual)		O	2.132	o
NAMPSChannelData (Target)		O	2.157	p
SOCStatus		O	2.262	a
TargetCellID		O	2.263	q
TDMABurstIndicator (Target)		O	2.268	a
TDMAChannelData (Target)		O	2.270	r
TDMAVoiceCoder (Target)		O	2.275	s

Notes:
a. May be included if target is a TDMA channel.
b. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 IOS handoff response information (e.g. IS-95 Channel Identity, IS-2000 Channel Identity, IS-2000 Service Configuration Record, IS-2000 Non-Negotiable Service Configuration Record, Extended Handoff Direction Parameters, Hard Handoff Parameters, [see *IOS*]).
c. Include if target is a CDMA channel.
d. Include only when *IS-95* channels are to be used at the Target MSC.
   Note: The presence of this parameter does not preclude the use of the CDMA2000HandoffResponseIOSData parameter to convey this same information.
e. For cdma2000 mobiles, the CDMACodeChannelList is used for the Fundamental Channel (FCH).
f. Include to indicate state information for the granted service option(s) connection reference.

g. Include appropriate granted privacy parameters, if available and if allowed for the user.

h. Include for implementations without the CDMA2000HandoffResponseIOSData parameter.

i. Include when communicating with TIA/EIA-41-D or earlier system. (replaced by CDMASearchParameters).

j. If the CDMAServiceConfigurationRecord was received in the INVOKE, include to indicate a granted service configuration, other than the one agreed upon by the Serving and Target Systems.

k. Include if the Serving MSC, the Target MSC, or both support only an A interface prior to IOS v4.1. This information will be ignored if the same information is received within the CDMA2000HandoffResponseIOSData parameter.

l. Include if target is an AMPS or NAMPS channel.

m. For forced handoffs to an analog voice channel, include the VMAC value set to the target system's expected MS power level at handoff for the identified AMPS or NAMPS Channel Number.

n. Include to reflect actual assignment if ConfidentialityModes (Desired) parameter was present in the INVOKE.

o. Include appropriate ISLP Information, if needed, for circuit-mode (e.g., ADS, G3 Fax) services. If excluded for circuit mode data calls, interpret as ISLP Supported.

p. Include if target is an NAMPS channel.

q. Include for an AMPS, NAMPS, or a TDMA handoff.

r. Include if target is a TDMA channel.

s. Include to indicate the granted Voice Coder if applicable. If not included the MS shall continue using the current Voice Coder.

2.18   FacilitiesRelease

The FacilitiesRelease (FACREL) operation is used to request that allocated resources for a call segment be released.

	INVOKING FE	RESPONDING FE
Case 1	MSC (Serving, Target, Anchor, or Tandem)	MSC (Serving, Target, Anchor, or Tandem)

The FacilitiesRelease operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitiesRelease INVOKE Parameters				Timer: CTT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
ReleaseReason		M	2.203	
BillingID		O	2.23	a
IMSI		O	2.127	b
MobileIdentificationNumber		O	2.140	b

Notes:

a.   Include for reporting the number of segments toward the Anchor MSC (see *DMH)*.

b.   Include if required by interconnection agreement.

The FacilitiesRelease operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

FacilitiesRelease RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
BillingID		O	2.23	a

Notes:

a.   Include for reporting the number of segments toward the Anchor MSC (see *DMH)*.

2.19 FacilitySelectedAndAvailable

The FacilitySelectedAndAvailable (FAVAIL) operation is used by a Serving MSC to obtain call treatment instructions from an SCP or SN.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	SCP
Case 2	MSC	SN

The FacilitySelectedAndAvailable operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FacilitySelectedAndAvailable INVOKE Parameters			Timer: FAVT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Serving)		M	2.23	
MSCID(Serving)		M	2.151	
TransactionCapability		M	2.285	
TriggerType		M	2.289	a
WINCapability		M	2.299	b
CallingPartyName		O	2.29	c
CallingPartyNumberDigits1		O	2.30	c
CallingPartyNumberDigits2		O	2.31	c
CallingPartySubaddress		O	2.34	c
ElectronicSerialNumber		O	2.112	
GroupInformation		O	2.124	c
IMSI		O	2.127	c, d
LegInformation		O	2.133	c
LocationAreaID		O	2.135	c
MobileDirectoryNumber		O	2.139	d, e
MobileIdentificationNumber		O	2.140	c, d
MSCIdentificationNumber		O	2.152	f
OneTimeFeatureIndicator		O	2.167	g
PilotBillingID		O	2.177	c
PilotNumber		O	2.178	c
PreferredLanguageIndicator		O	2.179	c

RedirectingNumberDigits	O	2.198	c
RedirectingPartyName	O	2.200	c
RedirectingSubaddress	O	2.201	c
ServingCellID	O	2.225	c
SystemMyTypeCode	O	2.260	
TerminationAccessType	O	2.279	h

Notes:

a. Indicates the detected trigger.

b. Include to identify the WIN capabilities supported.

c. Include if available.

d. One must be present for use as service key.

e. Include if available for recording purposes (see *DMH*).

f. Include to identify the MSC sending the message.

g. Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

h. Include if call involves a special access situation (e.g., *Roamer port access*).

The FacilitySelectedAndAvailable operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

FacilitySelectedAndAvailable RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AlertCode		O	2.4	c
DisplayText		O	2.106	d, i
DisplayText2		O	2.107	i, d
DMH_AccountCodeDigits		O	2.108	e
DMH_AlternateBillingDigits		O	2.109	e
DMH_BillingDigits		O	2.110	e
DMH_RedirectionIndicator		O	2.111	e, f
NoAnswerTime		O	2.165	g
OneTimeFeatureIndicator		O	2.167	h
TerminationTriggers		O	2.283	d
TriggerAddressList		O	2.286	d

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included.

b. Include if action to be performed is not implied through presence of other parameters.

c. Include to specify special alerting treatment.

d. Include if applicable.

e. Include if available for recording purposes (see *DMH*).

f. Include if redirection may apply.

g. Include to request an override of the Serving MSC's default *No Answer Time* value.

h. Include if modification to normal feature processing is required for the call in progress.

i. Include only one of these mutually exclusive parameters.

2.20 FeatureRequest

> This operation was named RemoteFeatureControlRequest prior to revision C of *IS-41*.

The FeatureRequest (FEATREQ) operation is used to request feature-related treatment on behalf of a registered MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1 (Note 1)	Serving MSC	HLR
Case 2 (Note 2)	Serving MSC	OTAF
Case 3	HLR	SCP or SN
Case4 (Note 3)	Serving MSC	Serving VLR
Case 5 (Note 3)	Serving VLR	HLR

Notes:

1. This case is termed a 'direct' FeatureRequest operation, since it occurs directly between the Serving MSC and the HLR without the involvement of the VLR.
2. This case is only applicable to CDMA OTASP.
3. These cases are no longer recommended.

The FeatureRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FeatureRequest INVOKE Parameters				Timer: FRRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
Digits (Dialed)		M	2.105	
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	k
BillingID (Originating)		O	2.23	a
CallingPartyName		O	2.29	j
CallingPartyNumberDigits1		O	2.30	b, l
CallingPartyNumberDigits2		O	2.31	b, l
CallingPartySubaddress		O	2.34	b

ConferenceCallingIndicator	O	2.84	c
MobileDirectoryNumber	O	2.139	d
MobileIdentificationNumber	O	2.140	n
MSCID (Serving)	O	2.151	e
MSCIdentificationNumber	O	2.152	m
OneTimeFeatureIndicator	O	2.167	f
PC_SSN	O	2.176	g
SenderIdentificationNumber	O	2.215	h
SystemMyTypeCode (originating MSC)	O	2.260	o
TransactionCapability	O	2.285	i

Notes:

a. Include for recording purposes or for call correlation (see *DMH)*.

b. Include if applicable.

c. Include to indicate the number of conferees already in the call.

d. Include if available for recording purposes (see *DMH)*.

e. Include to identify the Anchor MSC. (This may become the Originating MSC for subsequent call redirection.)

f. Include if any OneTimeFeatureIndicator parameter status bits are set (i.e., have value of *1*).

g. Include if SS7 may be used for subsequent call redirection.

h. Include if different from the MSCIdentificationNumber to identify the functional entity sending the message.

i. Include on *IS-41-C* or later.

j. Include if calling party name information is known.

k. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

l. Send only the *National* (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's numbering plan.

m. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

n. Include if known and if the IMSI has been included as MSID.

o. Include if available to identify the originating system manufacturer.

The FeatureRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

FeatureRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
FeatureResult		M	2.121	
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AnnouncementList		O	2.10	c
CallingPartyNumberString1		O	2.32	d
CallingPartyNumberString2		O	2.33	d
CallingPartySubaddress		O	2.34	d
CarrierDigits		O	2.37	d
ConferenceCallingIndicator		O	2.84	e
Digits (Dialed)		O	2.105	f
Digits (Destination)		O	2.105	l
DisplayText		O	2.106	m, p
DisplayText2		O	2.107	m, p
DMH_AccountCodeDigits		O	2.108	g
DMH_AlternateBillingDigits		O	2.109	g
DMH_BillingDigits		O	2.110	g
DMH_RedirectionIndicator		O	2.111	d
GroupInformation		O	2.124	h
MobileDirectoryNumber		O	2.139	g
NoAnswerTime		O	2.165	d
OneTimeFeatureIndicator		O	2.167	i
PACAIndicator		O	2.171	j
PilotNumber		O	2.178	h
PreferredLanguageIndicator		O	2.179	q
RedirectingNumberDigits		O	2.198	d
RedirectingNumberString		O	2.199	d
RedirectingSubaddress		O	2.201	d
RoutingDigits		O	2.209	d
TerminationList		O	2.280	k

TerminationTriggers	O	2.283	d
TriggerAddressList	O	2.286	o

Notes:

a.   Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b.   Include if action to be performed is not implied through presence of other parameters.

c.   Include if provision of one or more tones or announcements is required.

d.   Include if applicable.

e.   Include to direct that ongoing call be transformed into a Conference Call.

f.   Include if digits remain to be analyzed by the MSC. Encode the Digits (dialed) as *International* if:

-   The digits being returned are the result of a stored translation of the termination address into a destination address (e.g., the expansion of an abbreviated dialing string), and

-   the Serving MSC is known to be capable of accepting digits in an *International* format (e.g., the MSCIdentificationNumber parameter was received).

g.   Include if applicable and for recording purposes (see *DMH*).

h.   Include for multileg calls.

i.   Include if modification to normal feature processing is required for call in progress.

j.   Include to indicate PACA priority level.

k.   Include if call routing is required.

l.   Include to return a Temporary Reference Number from an OTAF for CDMA OTASP.

m.   Include for local termination to an MS if a related feature is active.

n.   Intentionally left for future modifications.

o.   Include to indicate addresses associated with active WIN triggers.

p.   Include only one of these mutually exclusive parameters.

q.   May be included to identify the Preferred Language to use when playing announcements.

2.21 FlashRequest

The FlashRequest (FLASHREQ) operation is used to forward a flash received from an MS engaged in a call toward the Anchor MSC (possibly via one or more Tandem MSCs).

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Anchor MSC
Case 2	Serving MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Anchor MSC

The FlashRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

FlashRequest INVOKE Parameters				Timer: FRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
Digits (Dialed)		M	2.105	a
InterMSCCircuitID		M	2.129	
ConfidentialityModes (Actual)		O	2.85	b
ElectronicSerialNumber		O	2.112	
EmergencyServicesRoutingDigits		O	2.113	d
IMSI		O	2.127	c
MobileIdentificationNumber		O	2.140	c

Notes:

a.   The Digits parameter is sent non-encrypted.

b.   Include if either the SignalingMessageEncryptionKey parameter or the CaveKey parameter was provided to the Serving MSC.

c.   Include if available.

d.   Include to specify the location of the MS.

The FlashRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

FlashRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				
SpecialHandling		O	2.249	a

Notes:

    a.   Include if any fields in this parameter are non-zero.

2.22   HandoffBack

The HandoffBack (`HANDBACK`) operation is used by the Serving MSC to request that the Target MSC initiate the Handoff-Back task. This task is used to handoff a call to a Target MSC to which the Serving MSC is already connected, for the call in question, via an inter-MSC trunk.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Target MSC

One of two possible results is returned:

1.   Notification that the request was accepted, including the parameters of the voice channel selected by the Target MSC on the designated cell.

2.   Notification that the request was unsuccessful because a voice channel on the designated cell is not available.

The HandoffBack operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffBack INVOKE Parameters			Timer: HOT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ChannelData (Serving)		M	2.81	a
InterMSCCircuitID		M	2.129	
MobileIdentificationNumber		M	2.140	
ServingCellID		M	2.225	
TargetCellID		M	2.263	
BillingID		O	2.23	b
ConfidentialityModes (Desired)		O	2.85	c
HandoffReason		O	2.125	d
HandoffState		O	2.126	e
SignalingMessageEncryptionKey		O	2.228	c, f
TDMABurstIndicator (Serving)		O	2.268	g
TDMACallMode		O	2.269	h, g
TDMAChannelData (Serving)		O	2.270	g
VoicePrivacyMask		O	2.297	i

Notes:

a.   This parameter has a length of 0 if a TDMA channel is in use.

b.   Include to maintain segment count.

c. Include if MS supports Signaling Message Encryption or Voice Privacy. The parameter shall be carried forward in any subsequent handoff.

d. Include if known.

e. Include if the call is in the awaiting answer or alerting state.

f. Include if Signaling Message Encryption may apply. This parameter shall be carried forward in any subsequent handoff.

g. Include if a TDMA channel is in use.

h. Include to indicate acceptable call modes.

i. Include if the Voice Privacy may apply. This parameter shall be carried forward in any subsequent handoff.

The HandoffBack operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffBack RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ChannelData (Target)		M	2.81	a
ConfidentialityModes (Actual)		O	2.85	b
TDMABurstIndicator (Target)		O	2.268	c
TDMAChannelData (Target)		O	2.270	d

Notes:

a. This parameter has a length of 0 if a TDMA channel has been assigned.

b. Include if ConfidentialityModes was requested to reflect actual assignment.

c. May be included if a TDMA channel has been assigned.

d. Include if a TDMA channel has been assigned.

2.23 HandoffBack2

The HandoffBack2 (HANDBACK2) operation is used by the Serving MSC to request that the Target MSC initiate the Handoff-Back task. This task is used to handoff a call to a Target MSC to which the Serving MSC is already connected, for the call in question, via an inter-MSC trunk. This operation differs from the HandoffBack operation in its addition of support for CDMA, multi-band TDMA, and NAMPS MSs.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Target MSC

The HandoffBack2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffBack2 INVOKE Parameters				Timer: HOT
Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID		M	2.23	
InterMSCCircuitID		M	2.129	
ServingCellID		M	2.225	a
BaseStationManufacturerCode		O	2.21	b
CaveKey		O	2.38	c
CDMA2000HandoffInvokeIOSData		O	2.39	d
CDMABandClassList		O	2.42	e
CDMACallMode		O	2.45	f, g, h
CDMAChannelData (Serving)		O	2.46	[f], i, j
CDMAConnectionReferenceList		O	2.54	[f], k, l
CDMAMobileProtocolRevision		O	2.55	[f]
CDMAMSMeasuredChannelIdentity		O	2.56	m
CDMAPrivateLongCodeMask		O	2.61	n
CDMAServiceConfigurationRecord		O	2.65	[f], o, p
CDMAServiceOptionList		O	2.67	[f], q
CDMAServingOneWayDelay		O	2.68	[a], [f]
CDMAStationClassMark		O	2.72	[f], ae, r, s
CDMAStationClassMark2		O	2.73	[f], ae
CDMATargetMAHOList		O	2.75	t

CDMATargetMeasurementList	O	2.77	u
ChannelData (Serving)	O	2.81	v
ConfidentialityModes (Desired)	O	2.85	w
DataKey	O	2.93	l
DataPrivacyParameters	O	2.94	x
HandoffReason	O	2.125	y
HandoffState	O	2.126	z
IMSI	O	2.127	aa
InterSwitchCount	O	2.130	y
ISLPInformation	O	2.132	ab
MobileIdentificationNumber	O	2.140	aa
MSLocation	O	2.155	f
NAMPSCallMode	O	2.156	h, ac
NAMPSChannelData (Serving)	O	2.157	ad
RandomVariable	O	2.189	l
SignalingMessageEncryptionKey	O	2.228	w
SpecialHandling	O	2.249	ae
StationClassMark	O	2.255	v, af, ag
SystemOperatorCode	O	2.261	ah
TargetCellID	O	2.263	ai
TDMABandwidth (Desired)	O	2.267	aj
TDMABurstIndicator (Serving)	O	2.268	af
TDMACallMode	O	2.269	h, af, ak
TDMAChannelData (Serving)	O	2.270	af
TDMAServiceCode	O	2.273	al, am
TDMATerminalCapability	O	2.273	al
TDMAVoiceCoder	O	2.275	an
TerminalType	O	2.278	ao
VoicePrivacyMask	O	2.297	ap

Notes:

a. For CDMA, the ServingCellID and CDMAServingOneWayDelay parameters correspond to the active set member having the shortest signal path to the MS (time reference cell).

b. Include if MS is *IS-136* or later and BSMC-specific signaling is supported.

c. Include if available and TDMA Enhanced Privacy and Encryption apply. This parameter shall be carried forward in subsequent handoffs.

d. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 handoff invoke information (e.g., IS-2000 Channel Identity, IS-2000 Mobile Capabilities, IS-2000 Service Configuration Record, [see *IOS*]).

e. Include to indicate band classes and band subclasses supported by the MS.

f. Include if CDMA handoff.

g. Include to indicate the acceptable call mode of other than AMPS (i.e., CDMA or NAMPS).

h. The values in these parameters shall not contain conflicting information.

i. The Long Code Mask field should be set to the long code mask in use at the serving MSC.

j. Include only when IS-95 channels are in use at the Serving MSC.
    Note: use of the CDMA2000HandoffInvokeIOSData parameter to convey this information is required for CDMA2000 and later channels.

k. Include to indicate state information for the requested service option(s) connection reference.

l. Include for CDMA data privacy, if applicable and if authorized for the user.

m. Include to indicate the band class and frequency that has been measured by the MS in preparation for hard handoff.

n. This parameter shall be provided if the MS supports CDMA and is authorized to have Voice Privacy and the CDMAPrivateLongCodeMask (CDMAPLCM) parameter is available.

o. Include to indicate a requested service configuration other than the one agreed upon by the Serving and Target Systems.

p. Include if the Serving MSC and the Target MSC support only an A-interface prior to IOS version 4.1.

q. Include to indicate the authorized service options.

r. Include if an 800 MHz CDMA channel is in use for an IS-41-C system.

s. Ignore on reception if the CDMAStationClassMark2 is also received and recognized.

t. Include for either the CDMA MAHO case or the forced CDMA handoff case.

u. Include for the CDMA non-MAHO case.

v. Include if an AMPS or NAMPS channel is in use.

w. Include if MS supports Signaling Message Encryption, Voice Privacy, Data Privacy, or TDMA Enhanced Privacy and Encryption. This parameter shall be carried forward in subsequent handoffs.

x. Include to indicate last known value of DP Data field. Do not include if contained in CDMAConnectionReferenceList

y. Include if known.

z. Include if the call is in the awaiting answer or alerting state.

aa. Include if available. At least one of these parameters should be present.

ab. Include appropriate ISLP Information, if needed, for circuit-mode (e.g., ADS, G3 Fax) services. If excluded for circuit mode data calls, interpret as ISLP supported.

ac. Include to indicate the acceptable call mode if other than AMPS (i.e., NAMPS).

ad. Include if an NAMPS channel is in use.

ae. Include to indicate information for the current band in use.

af. Include if a TDMA channel is in use.

ag. Include if the CDMA MS supports 800 MHz analog operation and the target system does not support CDMA.

ah. Include if the MS is IS-136 or later and SOC-specific signaling is supported.

ai. Include if an AMPS, NAMPS or a TDMA handoff.

aj. Include to describe the requested TDMA traffic channel. If omitted for data calls, assume to be Full-rate Digital Traffic Channel only.

ak. Include to indicate acceptable call modes.

al. Include if MS is TDMA *IS-136* or later.

am. Include to indicate requested TDMA service information.

an. Include to indicate subscriber or network preferences for Voice Coder selection when multiple voice coders exist. If not included, or if preferences can not be supported, the receiving system will select the Voice Coder based on the Mobile Station's terminal capabilities.

ao. Include for statistical purposes.

ap. This parameter shall be provided if the MS supports TDMA and is authorized to have Voice Privacy and the VoicePrivacyMask (VPMASK) parameter is available.

The HandoffBack2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffBack2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
BSMCStatus		O	2.25	a
CDMA2000HandoffResponseIOSData		O	2.40	b
CDMAChannelData (Target)		O	2.46	c, d
CDMACodeChannelList		O	2.51	c, e
CDMAConnectionReferenceList		O	2.54	c, f, g
CDMASearchParameters		O	2.63	c, h
CDMASearchWindow		O	2.64	c, i
CDMAServiceConfigurationRecord		O	2.65	c, j, k
ChannelData (Target)		O	2.81	l, m
ConfidentialityModes (Actual)		O	2.85	n
NAMPSChannelData (Target)		O	2.157	o
SOCStatus		O	2.262	a
TargetCellID		O	2.263	p
TDMABurstIndicator (Target)		O	2.268	a
TDMAChannelData (Target)		O	2.270	q
TDMAVoiceCoder (Target)		O	2.275	r

Notes:
a. May be included if target is a TDMA channel.
b. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 IOS handoff response information (e.g. IS-95 Channel Identity, IS-2000 Channel Identity, IS-2000 Service Configuration Record, IS-2000 Non-Negotiable Service Configuration Record, Extended Handoff Direction Parameters, Hard Handoff Parameters, [see *IOS*]).
c. Include if target is a CDMA channel.
d. Include only when *IS-95* channels are to be used at the Target MSC.
Note: this does not preclude use at the CDMA2000HandoffResponseIOSData parameter to convey this same information.
e. For cdma2000 mobiles, the CDMACodeCHannelList is used for the Fundamental Channel.
f. Include appropriate granted privacy parameters, if available and if allowed for the user.
g. Include to indicate state information for the granted service option(s) connection reference.

h. Include for implementations without the CDMA2000HandoffResponseIOSData parameter.

i. Include when communicating with *TIA/EIA-41-D* or earlier system. (replaced by CDMASearchParameters).

j. If the CDMAServiceConfigurationRecord was received in the INVOKE, include to indicate a granted service configuration, other than the one agreed upon by the Serving and Target Systems.

k. Include if the Serving MSC, the Target MSC, or both support only an A-interface prior to IOS v4.1.

l. Include if target is an AMPS or NAMPS channel.

m. For forced handoffs to an analog voice channel, include the VMAC value set to the target system's expected MS power level at handoff for the identified AMPS or NAMPS Channel Number.

n. Include to reflect actual assignment if ConfidentialityModes (Desired) parameter was present in the INVOKE.

o. Include if target is an NAMPS channel.

p. Include if the TargetCellID is different than that received in the INVOKE for an AMPS, NAMPS, or a TDMA handoff.

q. Include if target is a TDMA channel.

r. Include to indicate the granted Voice Coder if applicable. If not included the MS shall continue using the current Voice Coder.

2.24   HandoffMeasurementRequest

The HandoffMeasurementRequest (HANDMREQ) operation is sent by the Serving MSC to selected adjacent MSCs to request a signal quality measurement on the specified channel.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Adjacent MSC

This request should result in a response with one or more candidate cells.

The HandoffMeasurementRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffMeasurementRequest INVOKE Parameters				Timer: LMMRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ChannelData (Serving)		M	2.81	a
ServingCellID		M	2.225	
StationClassMark		M	2.255	
TDMACallMode		O	2.269	b
TDMAChannelData (Serving)		O	2.270	c

Notes:

   a.   This parameter has a length of 0 if a TDMA channel measurement is requested.

   b.   Include to indicate the current call modes.

   c.   Include if a TDMA channel measurement is requested.

The HandoffMeasurementRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffMeasurementRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SignalQuality		M	2.230	a
TargetCellID		M	2.263	a

Notes:

    a.   TargetCellID and SignalQuality parameters must appear in pairs. Multiple pairs may be returned.

2.25 HandoffMeasurementRequest2

The HandoffMeasurementRequest2 (HANDMREQ2) operation is sent by the Serving MSC to selected adjacent MSCs to request a signal quality measurement on the specified channel. This operation differs from the HandoffMeasurementRequest operation in its addition of support for CDMA, multi-band TDMA, and NAMPS MSs.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Adjacent MSC

The HandoffMeasurementRequest2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffMeasurementRequest2 INVOKE			Timer: LMMRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ServingCellID		M	2.225	
CDMACallMode		O	2.45	a, b
CDMAChannelData (Serving)		O	2.46	b
CDMAServiceConfigurationRecord		O	2.65	b
CDMAServingOneWayDelay		O	2.68	b
CDMAStationClassMark		O	2.72	k
CDMAStationClassMark2		O	2.73	l
ChannelData (Serving)		O	2.81	c
MSLocation		O	2.155	b
NAMPSCallMode		O	2.156	d
NAMPSChannelData (Serving)		O	2.157	e
StationClassMark		O	2.255	c, f
TargetCellIDList		O	2.264	j
TDMABandwidth (Desired)		O	2.267	i
TDMACallMode		O	2.269	g
TDMAChannelData (Serving)		O	2.270	f
TDMAServiceCode		O	2.273	h

Notes:

   a.   Include to indicate the current call mode if CDMA or NAMPS.

   b.   Include if a CDMA channel measurement is requested.

c.   Include if an AMPS or NAMPS channel measurement is requested.

d.   Include to indicate the current call mode if other than AMPS (i.e., NAMPS).

e.   Include if an NAMPS channel measurement is requested.

f.   Include to indicate the current call mode, if NAMPS.

g.   Include to indicate the current call mode, if TDMA.

h.   Include to indicate requested TDMA service information.

i.   Include to describe the requested TDMA traffic channel. If omitted for data calls, assume to be *Full-rate Digital Traffic Channel* only.

j.   Include to indicate the list of cells and sectors on which measurements are required.   The inclusion of this parameter and the sending of the HandoffMeasurementRequest2 INVOKE is based on service related statistics gathered by the Serving MSC regarding past handoff performance with border cells and sectors in neighboring MSCs. See section 520, Successful Handoff-Forward for MAHO with Measurement confirmation.

k.   Include if an 800 MHz channel is in use for an *IS-41-C* system.

l.   Include to indicate information for the current band in use.

The HandoffMeasurementRequest2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffMeasurementRequest2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CDMATargetMeasurementList		O	2.77	a
TargetMeasurementList		O	2.266	b

Notes:

a.   Include for CDMA measurement.

b.   Include for AMPS, NAMPS, or TDMA measurement.

2.26 HandoffToThird

The HandoffToThird (HANDTHIRD) operation is used by the Serving MSC (non-Anchor) to initiate a handoff with path minimization.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Anchor MSC
Case 2	Serving MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC

The HandoffToThird operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffToThird INVOKE Parameters				Timer: HTTT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
InterMSCCircuitID		M	2.129	
InterSwitchCount (Serving)		M	2.130	
MobileIdentificationNumber		M	2.140	
MSCID (Target)		M	2.151	
ServingCellID		M	2.225	
StationClassMark		M	2.255	
TargetCellID		M	2.263	
BillingID		O	2.23	a
ChannelData (Serving)		O	2.81	b
ConfidentialityModes (Desired)		O	2.85	c
HandoffReason		O	2.125	d
SignalingMessageEncryptionKey		O	2.228	c
TDMABurstIndicator (Serving)		O	2.268	e
TDMACallMode		O	2.269	f
TDMAChannelData (Serving)		O	2.270	e
VoicePrivacyMask		O	2.297	g

Notes:

    a.   Include to maintain segment count.

    b.   Include if the current call mode is AMPS.

c.   Include if MS supports Signaling Message Encryption or Voice Privacy. The parameter shall be carried forward in any subsequent handoff. If one parameter is present, they all must be present.

d.   Include if known.

e.   Include if a TDMA channel is in use.

f.   Include to indicate the acceptable call mode.

g.   Include if Voice Privacy may apply.

The HandoffToThird operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffToThird RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ChannelData (Target)		O	2.81	a
ConfidentialityModes (Actual)		O	2.85	b
TDMABurstIndicator (Target)		O	2.268	c
TDMAChannelData (Target)		O	2.270	d

Notes:

a.   Include if an AMPS channel has been assigned.

b.   Include to reflect actual assignment if the ConfidentialityModes parameter was present in the INVOKE.

c.   May be included if a TDMA channel has been assigned.

d.   Include if a TDMA channel has been assigned.

2.27 HandoffToThird2

The HandoffToThird2 (HANDTHIRD2) operation is used by the Serving MSC (non-Anchor) to initiate a handoff with path minimization. This operation differs from the HandoffToThird operation in its support of dual-mode CDMA, multi-band TDMA, and NAMPS MSs.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Anchor MSC
Case 2	Serving MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC

The HandoffToThird2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

HandoffToThird2 INVOKE Parameters				Timer: HTTT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
BillingID		M	2.23		
ElectronicSerialNumber		M	2.112		
InterMSCCircuitID		M	2.129		
InterSwitchCount (Serving)		M	2.130		
MSCID (Target)		M	2.151		
ServingCellID		M	2.225	a	
BaseStationManufacturerCode		O	2.21	b	
CaveKey		O	2.38	c	
CDMA2000HandoffInvokeIOSData		O	2.39	d	
CDMABandClassList		O	2.44	e	
CDMACallMode		O	2.45	f, g	
CDMAChannelData (Serving)		O	2.46	f, h, i	
CDMAConnectionReferenceList		O	2.54	f, j	
CDMAMobileProtocolRevision		O	2.55	f, k	
CDMAMSMeasuredChannelIdentity		O	2.56	l	
CDMAPrivateLongCodeMask		O	2.61	m	
CDMAServiceConfigurationRecord		O	2.65	f, n, o	
CDMAServiceOptionList		O	2.67	f, p	
CDMAServingOneWayDelay		O	2.68	a, f	
CDMAStationClassMark		O	2.72	f, k, q, r	

CDMAStationClassMark2	O	2.73	f, k
CDMATargetMAHOList	O	2.75	s
CDMATargetMeasurementList	O	2.77	t
ChannelData (Serving)	O	2.81	u
ConfidentialityModes (Desired)	O	2.85	v
DataKey	O	2.93	w
DataPrivacyParameters	O	2.94	x
HandoffReason	O	2.125	y
HandoffState	O	2.126	z
IMSI	O	2.127	aa
ISLPInformation	O	2.132	ab
MobileIdentificationNumber	O	2.140	aa
MSLocation	O	2.155	f
NAMPSCallMode	O	2.156	g, ac
NAMPSChannelData (Serving)	O	2.157	ad
RandomVariable	O	2.189	w
SignalingMessageEncryptionKey	O	2.228	v
SpecialHandling	O	2.249	ae
StationClassMark	O	2.255	u, ak, af
SystemOperatorCode	O	2.261	ag
TargetCellID	O	2.263	ah
TDMABandwidth (Desired)	O	2.267	ai
TDMABurstIndicator (Serving)	O	2.268	ak
TDMACallMode	O	2.269	g, aj, ak
TDMAChannelData (Serving)	O	2.270	ak
TDMAServiceCode	O	2.273	al, am
TDMATerminalCapability	O	2.274	al
TDMAVoiceCoder	O	2.275	an
TerminalType	O	2.278	ao
UserZoneData	O	2.294	ap
VoicePrivacyMask	O	2.297	aq

Notes:

a. For CDMA, the ServingCellID and CDMAServingOneWayDelay parameters correspond to the active set member having the shortest signal path to the MS (time reference cell).

b. Include if the MS is *IS-136* or later and BSMC-specific signaling is supported.

c. Include if available and TDMA Enhanced Privacy and Encryption apply. This parameter shall be carried forward in subsequent handoffs.

d. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 handoff invoke information (e.g., IS-2000 Channel Identity, IS-2000 Mobile Capabilities, IS-2000 Service Configuration Record, [see *IOS*]).

e. Include to indicate band classes and band subclasses supported by the MS.

f. Include if CDMA handoff.

g. The values in these parameters shall not contain conflicting information.

h. The Long Code Mask field should be set to the long code mask in use at the Serving MSC.

i. Include only when *IS-95* channels are in use at the Serving MSC.
    Note: use at the CDMA2000HandoffInvokeIOSData parameter to convey this information is required for CDMA2000 and later channels.

j. Include to indicate state information for the requested service option(s) connection reference.

k. Include to indicate information for the current band in use.

l. Include to indicate the band class and frequency that has been measured by the MS in preparation for hard handoff.

m. This parameter shall be provided if the MS supports CDMA and is authorized to have Voice Privacy and the CDMAPrivateLongCodeMask parameter is available.

n. Include to indicate a requested service configuration other than the one agreed upon by the Serving and Target Systems.

o. Include if the Serving MSC, the Target MSC, or both support only an A-interface prior to IOS v4.1.

p. Include to indicate the authorized service options.

q. Include if an 800 MHz CDMA channel is in use for an *IS-41-C* system.

r. Ignore on reception if the CDMAStationClassMark2 parameter is also received and recognized.

s. Include for either the CDMA MAHO case or the forced handoff case.

t. Include for the CDMA non-MAHO case.

u. Include if an AMPS or NAMPS channel is in use.

v. Include if MS supports Signaling Message Encryption, Voice Privacy, Data Privacy, or TDMA Enhanced Privacy and Encryption. This parameter shall be carried forward in subsequent handoffs.

w. Include for CDMA data privacy, if applicable and if authorized for the user.

x. Include to indicate last known value of DP Data filed. Do not include if contained in CDMAConnectionReferenceList.

y. Include if known.

z. Include if the call is in the awaiting answer or alerting state.

aa. Include if available. At least one of these parameters should be present.

ab. Include appropriate ISLP Information, if needed, for circuit-mode (e.g., ADS, G3 Fax) services. If excluded for circuit mode data calls, interpret as *ISLP supported*.

ac. Include to indicate the current call mode if other than AMPS (i.e., NAMPS).

ad. Include if an NAMPS channel is in use.

ae. Include if any fields in this parameter are non-zero.

af. Include if the CDMA MS supports 800 MHz analog operation and the target system does not support CDMA.

ag. Include if the MS is *IS-136* or later and SOC-specific signaling is supported.

ah. Include if an AMPS, NAMPS or a TDMA handoff.

ai. Include to describe the requested TDMA traffic channel. If omitted for data calls, assume to be *Full-rate Digital Traffic Channel* only.

aj. Include to indicate the acceptable call mode.

ak. Include if TDMA channel is in use.

al. Include if MS is TDMA *IS-136* or later.

am. Include to indicate requested TDMA service information.

an. Include to indicate subscriber or network preferences for Voice Coder selection when multiple voice coders exist. If not included, or if preferences can not be supported, the receiving system will select a Voice Coder based on Terminal Capability.

ao. Include for statistical purposes.

ap. Include if the MS is authorized for User Zone Service. Include to permit the Target MSC to validate MS selection of User Zone.

aq. This parameter shall be provided if the MS supports TDMA and is authorized to have Voice Privacy and the VoicePrivacyMask (VPMASK) parameter is available.

The HandoffToThird2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

HandoffToThird2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
BSMCStatus		O	2.25	a
CDMA2000HandoffResponseIOSData		O	2.40	b
CDMAChannelData (Target)		O	2.46	c, r
CDMACodeChannelList		O	2.51	c, d
CDMAConnectionReferenceList		O	2.54	c, e, f
CDMASearchParameters		O	2.63	c, g
CDMASearchWindow		O	2.64	c, h
CDMAServiceConfigurationRecord		O	2.65	c, i, j
ChannelData (Target)		O	2.81	k, l
ConfidentialityModes (Actual)		O	2.85	m
NAMPSChannelData (Target)		O	2.157	n
SOCStatus		O	2.262	a
TargetCellID		O	2.263	o

TDMABurstIndicator (Target)	O	2.268	a
TDMAChannelData (Target)	O	2.270	p
TDMAVoiceCoder (Target)	O	2.275	q

Notes:

a. May be included if target is a TDMA channel.

b. If the Serving MSC and the Target MSC support *TIA/EIA/IS-2001-A* (IOS v4.1) or later, include to convey required cdma2000 IOS handoff response information (e.g., IS-2000 Channel Identity, IS-2000 Service Configuration Record, IS-2000 Non-Negotiable Service Configuration Record, Extended Handoff Direction Parameters, Hard Handoff Parameters, [see *IOS*]).

c. Include if target is a CDMA channel.

d. For cdma2000 mobiles, the CDMACodeChannelList is used for the Fundamental Channel.

e. Include to indicate state information for the granted service option(s) connection reference.

f. Include appropriate requested privacy parameters, if available and if allowed for the user.

g. Include for implementations without the CDMA2000HandoffResponseIOSData parameter.

h. Include when communicating with *TIA-41-D* or earlier system. (replaced by CDMASearchParameters).

i. Include to indicate a granted service configuration, other than the one agreed upon by the Serving and Target Systems.

j. Include if the serving MSC, the Target MSC, or both support only an A-Interface prior to IOS version 4.1.

k. Include if target is an AMPS or NAMPS channel.

l. For forced handoffs to an analog voice channel, include the VMAC value set to the target system's expected MS power level at handoff for the identified AMPS or NAMPS Channel Number.

m. Include to reflect actual assignment if ConfidentialityModes (Desired) parameter was present in the INVOKE.

n. Include if target is an NAMPS channel.

o. Include for an AMPS, NAMPS, or a TDMA handoff.

p. Include if target is a TDMA channel.

q. Include to indicate the granted Voice Coder if applicable. If not included the MS shall continue using the current Voice Coder.

r. Include only when *IS-95* channels are to be used at the Target MSC.
Note: this does not preclude use at the CDMA2000HandoffResponseIOSData parameter to convey this same information.

2.28 InformationDirective

The InformationDirective (INFODIR) operation is used by the HLR to direct the serving system to provide a specified notification to an idle MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	Serving VLR
Case 2	Serving VLR	Serving MSC

The InformationDirective is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMITION package. The Parameter Set is encoded as follows:

InformationDirective INVOKE Parameters				Timer: IDT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
ElectronicSerialNumber		M	2.112		
MSID		M	2.153	e	
AlertCode		O	2.4	a	
AnnouncementList		O	2.10	b	
CallingPartyNumberString1		O	2.32	c	
CallingPartyNumberString2		O	2.33	c	
CallingPartySubaddress		O	2.34	c	
DisplayText		O	2.106	c, f	
DisplayText2		O	2.107	c, f	
RedirectingNumberString		O	2.199	c	
RedirectingSubaddress		O	2.201	c	
SenderIdentificationNumber		O	2.215	d	

Notes:

a. Include if MS is to be alerted.

b. Include if one or more tones or announcements are to be applied to the MS.

c. Include if authorized and available.

d. May be included to identify the functional entity sending the message.

e. The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System; otherwise the HLR includes the MobileIdentificationNumber type of MSID. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received from the HLR.

f.   Include only one of these mutually exclusive parameters.

The InformationDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InformationDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
AlertResult		O	2.5	a

Notes:

a.   Include if requested via AlertCode parameter in the InformationDirective INVOKE.

2.29 InformationForward

The InformationForward (`INFOFWD`) operation is used by the Anchor MSC to transfer information concerning the Served MS to the Serving MSC after handoff (e.g., a message waiting status change).

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Serving MSC
Case 2	Anchor MSC	Tandem MSC
Case 3	Tandem MSC	Serving MSC

The InformationForward operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMITION package. The Parameter Set is encoded as follows:

InformationForward INVOKE Parameters				Timer: IFT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
InterMSCCIrcuitID		M	2.129		
MobileIdentificationNumber		O	2.140	e	
AlertCode		O	2.4	a	
AnnouncementList		O	2.10	a	
CallingPartyNumberString1		O	2.32	b	
CallingPartyNumberString2		O	2.33	b	
CallingPartySubaddress		O	2.34	b	
DisplayText		O	2.106	c, d	
DisplayText2		O	2.107	c, d	
ElectronicSerialNumber		O	2.112	a	
IMSI		O	2.127	e	
MessageWaitingNotificationCount		O	2.136	a	
MessageWaitingNotificationType		O	2.137	a	
RedirectingNumberString		O	2.199	b	
RedirectingSubaddress		O	2.201	b	

Notes:

a. Include if appropriate.

b. Include if MS is authorized for CNIP.

c. Include if available.

d. Include only one of these mutually exclusive parameters.

e. Include if available. At least one of these parameters should be present.

The InformationForward operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InformationForward RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
AlertResult		O	2.5	a

Notes:

a.   Include if requested via AlertCode parameter in the corresponding INVOKE.

2.30   InstructionRequest

The InstructionRequest (INSTREQ) operation is used by the SRF to obtain instructions from the SCF for the particular resource seized. This operation is used when the SRF determines that one of its resources, allocated by a SeizeResource operation, has been seized through the establishment of a connection from the SSF.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	IP	SCP or SN or HLR
Case 2	SN	SCP or SN or HLR

The InstructionRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

InstructionRequest INVOKE Parameters			Timer: IRT (note a)		
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	zero octets	M	520-1.3.2.1		
Contents					

Notes:

a.   The Instruction Request Timer (IRT) is started when an InstructionRequest INVOKE is sent and stopped when an SRFDirective INVOKE or an InstructionRequest RETURN RESULT is received by the SRF.

The InstructionRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InstructionRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.31 InterSystemAnswer

The InterSystemAnswer (ISANSWER) operation can be used in two types of scenarios:

- It is used by a Border MSC to notify the Serving MSC that an MS has successfully answered an alert in the Border MSC.

- It is used by either an Anchor MSC or a Serving MSC after handoff has occurred to indicate that a call in the awaiting answer or alerting state has been answered.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Serving MSC
Case 2	Serving MSC	Anchor MSC

The InterSystemAnswer operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemAnswer INVOKE Parameters				Timer: ISAT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
ElectronicSerialNumber		O	2.112	a
IMSI		O	2.127	b
MobileIdentificationNumber		O	2.140	b

Notes:

    a.   Include if appropriate.

    b.   Include if available. At least one of these parameters should be present.

The InterSystemAnswer operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemAnswer RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.32 InterSystemPage

The InterSystemPage (ISPAGE) operation is used by a Serving MSC to request a Border MSC to either (a) page an MS, or (b) listen for a page response from an MS, in the Border MSC prior to Call Delivery. If the MS's presence is confirmed on the Border MSC, the MS should be registered in the Border MSC and the call is delivered directly to the Border MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Border MSC

The InterSystemPage operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemPage INVOKE Parameters				Timer: ISPRT	
Field	Value	Type	Reference	Notes	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
BillingID (Originating)		M	2.23		
ElectronicSerialNumber		M	2.112		
AlertCode		O	2.4	a	
CallingPartyName		O	2.29	a	
CallingPartyNumberDigits1		O	2.30	a	
CallingPartyNumberDigits2		O	2.31	a	
CallingPartyNumberString1		O	2.32	a	
CallingPartyNumberString2		O	2.33	a	
CallingPartySubaddress		O	2.34	a	
CDMA2000MobileSupportedCapabilities		O	2.41	q	
CDMABandClass		O	2.42	x	
CDMABandClassList		O	2.44	ab	
CDMAMobileProtocolRevision		O	2.55	c	
CDMAServiceOption		O	2.66	m	
CDMAServiceOptionList		O	2.67	o	
CDMASlotCycleIndex		O	2.70	b	
CDMAStationClassMark		O	2.72	x, y	
CDMAStationClassMark2		O	2.73	x	
ControlChannelMode		O	2.87	v	
DMH_AccountCodeDigits		O	2.108	a	
DMH_AlternateBillingDigits		O	2.109	a	

DMH_BillingDigits	O	2.110	a
DisplayText	O	2.106	a, r
DisplayText2	O	2.107	a, r
ExtendedMSCID (Serving MSC)	O	2.116	d
ExtendedSystemMyTypeCode (Serving MSC)	O	2.117	e
IMSI	O	2.127	s
LegInformation	O	2.133	f
LocationAreaID	O	2.135	f
MINExtension	O	2.138	f
MobileDirectoryNumber	O	2.139	a
MobileIdentificationNumber	O	2.140	s
MSCIdentificationNumber (Originating MSC)	O	2.152	z
MSCID (Originating MSC)	O	2.151	g
MSIDUsage	O	2.154	t
NoAnswerTime	O	2.165	a
NetworkTMSI	O	2.158	s
OneTimeFeatureIndicator	O	2.167	f
PageCount	O	2.172	aa
PageIndicator	O	2.173	h
PageResponseTime	O	2.174	u
PagingFrameClass	O	2.175	w
PC_SSN (Originating MSC)	O	2.176	i
PilotBillingID	O	2.177	j
PilotNumber	O	2.178	k
PreferredLanguageIndicator	O	2.179	a
RedirectingNumberDigits	O	2.198	a
RedirectingNumberString	O	2.199	a
RedirectingPartyName	O	2.200	a
RedirectingSubaddress	O	2.201	a
SenderIdentificationNumber (Serving MSC)	O	2.215	d
SystemMyTypeCode (Originating MSC)	O	2.260	l
TDMADataFeaturesIndicator	O	2.271	p
TDMAServiceCode	O	2.273	n
TerminalType	O	2.278	f
TerminationTreatment	O	2.282	f
TerminationTriggers	O	2.283	a
TriggerAddressList	O	2.286	a

Notes:

a.　Include if available (i.e., provided in the associated RoutingRequest INVOKE).

b.　Included when the Serving MSC knows that the MS is operating in CDMA Slotted Mode.

c.　Include if a CDMA channel is in use.

d.　Include to identify the Serving MSC.

e.　Include to identify Serving MSC manufacturer.

f.　Include if known.

g.　Include to identify originating system.

h.　Include if request is to listen only. May include if request is to page.

i.　Include if available for subsequent call redirection.

j.　Include if appropriate.

k.　Include on a multi-leg call.

l.　Include to identify originating system manufacturer.

m.　Include to specify requested CDMA service information

n.　Include to specify requested TDMA service information

o.　Include to indicate preferred CDMA service options in descending order of preference

p.　Include to indicate allowed TDMA data services.

q.　Include for cdma2000 MSs or later.

r.　Include only one of these mutually exclusive parameters.

s.　Include if available. At least one parameter should be present.

t.　For TDMA, identifies the MSID last used to calculate the control channel and paging slot.

u.　Include to indicate the maximum time that the receiving system has to respond to this message.

v.　Include if the MS is Digital Control Channel capable, to indicate the last known access mode.

w.　Include if the MS is Digital Control Channel capable, to indicate the current Paging Frame Class for the Mobile Station.

x.　Include to indicate information about the current band in use.

y.　Include if an 800 MHz CDMA channel is in use for an *IS-41-C* system.

z.　Include to identify the originating MSC and to indicate that the MSC is capable of accepting digits in the international format.

aa.　Include to indicate the recommended number of sequential paging attempts that the receiving system is expected to do.

ab.　Include to indicate other CDMA band classes supported.

The InterSystemPage operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemPage RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
BillingID (Terminating)		O	2.23	b, d
CDMAServiceOption		O	2.66	g
ConditionallyDeniedReason		O	2.83	c
Digits (Destination)		O	2.105	d
ExtendedMSCID (Border MSC)		O	2.116	d
ExtendedSystemMyTypeCode (Border MSC)		O	2.117	d
MSCIdentificationNumber		O	2.152	e
PC_SSN (Border MSC)		O	2.176	f
TDMAServiceCode		O	2.273	h

Notes:

a. Include if access may be denied.

b. Required for recording purposes (see *DMH*).

c. Include if Call Waiting is possible.

d. If one parameter is present, they all must be present.

e. Include to identify the Border MSC.

f. Include if Digits (Destination) parameter is provided, SS7 is used, and the Originating MSC and the Border MSC may be in the same national SS7 network.

g. Include to identify accepted CDMA service information.

h. Include to identify accepted TDMA service information.

2.33 InterSystemPage2

The InterSystemPage2 (ISPAGE2) operation is used by a Serving MSC that has received a call via a TLDN to request a Border MSC to either (a) page an MS, or (b) listen for a page response from an MS, in the Border MSC. If an MS's presence is confirmed in the Border MSC, the call is terminated to the Border MSC via intersystem trunk facilities.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Border MSC

The InterSystemPage2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemPage2 INVOKE Parameters				Timer: ISPRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Anchor MSC)		M	2.23	
ElectronicSerialNumber		M	2.112	
AlertCode		O	2.4	a
CallingPartyNumberString1		O	2.32	a
CallingPartyNumberString2		O	2.33	a
CallingPartySubaddress		O	2.34	a
CDMA2000MobileSupportedCapabilities		O	2.41	j
CDMABandClass		O	2.42	u
CDMABandClassList		O	2.44	w
CDMAMobileProtocolRevision		O	2.55	c
CDMAServiceOption		O	2.66	f
CDMAServiceOptionList		O	2.67	h
CDMASlotCycleIndex		O	2.70	b
CDMAStationClassMark		O	2.72	u, v
CDMAStationClassMark2		O	2.73	u
ControlChannelMode		O	2.87	s
DisplayText		O	2.106	a, x
DisplayText2		O	2.107	a, x
IMSI		O	2.127	k
LocationAreaID		O	2.135	d
MINExtension		O	2.138	d
MobileDirectoryNumber		O	2.139	a

MobileIdentificationNumber	O	2.140	k
MSIDUsage	O	2.154	l
NetworkTMSI	O	2.158	k
NonPublicData	O	2.166	m
PageCount	O	2.172	n
PageIndicator	O	2.173	e
PageResponseTime	O	2.174	o
PagingFrameClass	O	2.175	t
PSID_RSIDList	O	2.184	p, q
RedirectingNumberString	O	2.199	a
RedirectingSubaddress	O	2.201	a
TerminalType	O	2.278	d
TDMADataFeaturesIndicator	O	2.271	i
TDMAServiceCode	O	2.273	g
UserZoneData	O	2.294	q, r

Notes:

a.   Include if available (i.e., provided in associated RoutingRequest INVOKE).

b.   Included when the Serving MSC knows that the MS is operating in CDMA Slotted Mode.

c.   Include if a CDMA channel is in use.

d.   Include if known.

e.   Include if request is to listen only. May include if request is to page.

f.   Include to specify requested CDMA service information.

g.   Include to specify requested TDMA service information.

h.   Include to indicate the authorized service options for the MS that are also supported by the sending network entity.

i.   Include to indicate allowed TDMA data services.

j.   Include for cdma2000 MSs or later.

k.   Include if available. At least one parameter should be present.

l.   For TDMA, identifies the MSID last used to calculate the control channel and paging slot.

m.   Include to provide information regarding Non-Public Information Display (e.g., User Zone updates) in the border system.

n.   Include to indicate the recommended number of sequential paging attempts that the receiving system is expected to do.

o.   Include to indicate the maximum time that the receiving system has to respond to this message.

p.   For TDMA, include to indicate the list of accepted PSIDs/RSIDs for the indicated MS.

q. The PSID_RSIDList and UserZoneData parameters are mutually exclusive.

r. Include to perform User Zone updates at the Border System.

s. Include if the MS is Digital Control Channel capable to indicate the last known access mode.

t. Include if the MS is Digital Control Channel capable to indicate the current Paging Frame Class for the Mobile Station.

u. Include to indicate information about the last reported band class and band subclass (if applicable) in use. When multiple band classes or multiple band subclasses apply due to overlapping spectrum definitions, the included band class and band subclass (if applicable) is based on value reported by the RAN.

v. Include if an 800 MHz CDMA channel is in use for an *IS-41-C* or *TIA/EIA-41-D* system.

w. Include to indicate the band classes and band subclasses supported by the MS.

x. Include only one of these mutually exclusive parameters.

The InterSystemPage2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemPage2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
AuthenticationResponse		O	2.14	b
CallHistoryCount		O	2.26	b
CDMAServiceOption		O	2.66	d
RANDC		O	2.188	h
RandomVariable		O	2.189	c
SystemAccessType		O	2.258	b
SystemCapabilities (Border MSC)		O	2.259	g
TDMADataMode		O	2.272	e
TDMAServiceCode		O	2.273	f
TerminalType		O	2.278	g

Notes:

a. Include if MS is not available or if access may be denied.

b. Include if authentication parameters were received from the MS.

c. Include if authentication parameters were received from the MS and the value of RAND used by the MS to compute AUTHR was determined.

d.   Include to identify accepted CDMA service information.

e.   Include TDMA data services.

f.   Include to identify accepted TDMA service information.

g.   Included for *IS-778* or later.

h.   Include if authentication parameters were received from the MS and the value of RAND used by the MS to compute AUTHR cannot be determined.

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2.34 InterSystemSetup

The InterSystemSetup (`ISSETUP`) operation is used by a Serving MSC to request a Border MSC to perform call setup actions; i.e., connect the voice channel in which the MS confirmation has been received to the intersystem trunk facility specified by the Serving MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Border MSC

The InterSystemSetup operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemSetup INVOKE Parameters				Timer: ISSRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Anchor MSC)		M	2.23	
ElectronicSerialNumber		M	2.112	
InterMSCCircuitID		M	2.129	
CaveKey		O	2.38	a, b
CDMAPrivateLongCodeMask		O	2.61	a
ChangeServiceAttributes		O	2.80	d
DataKey		O	2.93	e
DisplayText		O	2.106	a, g
DisplayText2		O	2.107	a, g
IMSI		O	2.127	c
ISLPInformation (Desired)		O	2.132	f
MobileIdentificationNumber		O	2.140	c
SignalingMessageEncryptionKey		O	2.228	a
VoicePrivacyMask		O	2.297	a

Notes:

a. Include if available.

b. Include for TDMA Enhanced Privacy and Encryption.

c. Include if available. At least one parameter should be present.

d. Include to indicate whether or not a Service Negotiation operation is required.

e. Include if available and CDMA data privacy is authorized for the user.

f.   Include appropriate ISLP Information, if needed, for circuit-mode (e.g., ADS, G3 Fax) services. If excluded for circuit mode data calls, interpret as *ISLP supported*.

g.   Include only one of these mutually exclusive parameters.

The InterSystemSetup operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemSetup RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CDMAServiceOption		O	2.66	a
SetupResult		O	2.226	b
ISLPInformation (Actual)		O	2.132	c

Notes:

a.   Include to identify the final CDMA service information negotiated.

b.   Include to report the result of the operation.

c.   Include appropriate ISLP information for circuit-mode services.

2.35 InterSystemSMSDeliveryPointToPoint

The InterSystemSMSDeliveryPointToPoint (ISSMDPP) operation is used to relay an SMS message from the Serving MSC for an MS-based SME to a Border MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The InterSystemSMSDeliveryPointToPoint operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemSMSDeliveryPointToPoint INVOKE Parameters			Timer: SMT		
Field	**Value**	**Type**	**Reference**		**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
SMS_BearerData		M	2.233		
SMS_TeleserviceIdentifier		M	2.246		
IMSI		O	2.127		a
MobileIdentificationNumber		O	2.140		a
SignalingMessageEncryptionKey		O	2.228		b
SMS_MessageCount		O	2.237		c
SMS_OriginalOriginatingAddress		O	2.242		d
SMS_OriginalOriginatingSubaddress		O	2.243		e

Notes:

a. Include if available. At least one parameter should be present.

b. Include if available.

c. Include if applicable. If not received, assume value 0.

d. Include to identify the SME from which the short message originated (e.g., the MDN, if originated by an MS-based SME).

e. Include if applicable.

The InterSystemSMSDeliveryPointToPoint operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemSMSDeliveryPointToPoint RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b

Notes:

    a.   Include for positive or negative acknowledgments, when applicable.

    b.   Include for all negative acknowledgments.

2.36 InterSystemSMSPage

The InterSystemSMSPage (ISSMSPAGE) operation is a general purpose operation that is used to convey an MS-terminated short message or in general any other information or encapsulated data to a Border MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Border MSC

The InterSystemSMSPage operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

InterSystemSMSPage INVOKE Parameters			Timer: **ISSPT**	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
SMS_BearerData		M	2.236	
SMS_TeleserviceIdentifier		M	2.249	
CDMA2000MobileSupportedCapabilities		O	2.42	a
CDMASlotCycleIndex		O	2.71	b
CDMAStationClassMark		O	2.73	c, d
ElectronicSerialNumber		O	2.113	e
IMSI		O	2.130	f
LocationAreaID		O	2.138	g
MobileIdentificationNumber		O	2.143	f
NetworkTMSI		O	2.161	f
PageIndicator		O	2.173	h
PageResponseTime		O	2.174	i
SMS_ChargeIndicator		O	2.238	j
SMS_DestinationAddress		O	2.239	k
SMS_OriginalDestinationAddress		O	2.243	l
SMS_OriginalDestinationSubaddress		O	2.244	m
SMS_OriginalOriginatingAddress		O	2.245	n
SMS_OriginalOriginatingSubaddress		O	2.246	m
SMS_OriginatingAddress		O	2.247	o

Notes:

a.   Include for cdma2000 mobiles or later.

b.   Included when the Serving MSC knows that the MS is operating in CDMA Slotted Mode.

c.   Include to indicate information of the current band in use.

d.   Include if an 800 MHz *CDMA* channel is in use for an *IS-41-C* system.

e.   Include to identify the destination MS.

f.   Include if known and available, may be excluded if the parameter is known not to be supported by the Border MSC. At least one parameter shall be included.

g.   Include if known.

h.   Include if request is to listen only. May include if request is to page.

i.   Include to indicate the maximum time that the receiving system has to respond to this message.

j.   Include if applicable. If not received, charge message originator.

k.   Include if different than the destination address (MobileIdentificationNumber or underlying data transport destination address). May require an interconnection agreement to facilitate interworking between network types.

l.   Include if different than the destination address (MobileIdentificationNumber, SMS_DestinationAddress, or underlying data transport destination address).

m.   Include if applicable.

n.   Include if different than the originating address (SMS_OriginatingAddress or underlying data transport originating address).

o.   Include if different than the MobileIdentificationNumber, or if not carried by the underlying data transport. May require an interconnection agreement to facilitate interworking between network types.

The ISSMSPAGE operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

InterSystemSMSPage RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_BearerData		O	2.236	a
SMS_CauseCode		O	2.237	b

Notes:

    a.   Include for positive acknowledgments, when applicable.

    b.   Include for all negative acknowledgments.

2.37 LocationRequest

The LocationRequest (LOCREQ) operation is used by an Originating MSC to obtain call treatment instructions from the HLR. The call is identified by the dialed MS address digits received by the Originating MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Originating MSC	HLR

The LocationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

LocationRequest INVOKE Parameters				Timer: LRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Originating)		M	2.23	
Digits (Dialed)		M	2.105	
MSCID (Originating)		M	2.151	
SystemMyTypeCode (Originating)		M	2.260	
CallingPartyName		O	2.29	a
CallingPartyNumberDigits1		O	2.30	a, j
CallingPartyNumberDigits2		O	2.31	a, j
CallingPartySubaddress		O	2.34	a
CDMAServiceOption		O	2.66	f
MSCIdentificationNumber		O	2.152	b
PC_SSN		O	2.176	c
RedirectingNumberDigits		O	2.198	a
RedirectingPartyName		O	2.200	a
RedirectingSubaddress		O	2.201	a
TerminationAccessType		O	2.279	d
TDMAServiceCode		O	2.273	g
TransactionCapability		O	2.285	e
TriggerType		O	2.289	i
WINCapability		O	2.299	h

Notes:

a. Include if available (i.e., provided in call origination).

b. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

c. Include if SS7 may be used for subsequent call redirection.

d. Include if call involves a special access situation (e.g., *Roamer port access*).

e. Include on *IS-41-C* or later.

f. Include to identify requested CDMA service information.

g. Include to identify requested TDMA service information.

h. Include to identify the WIN capabilities supported.

i. Include to identify the trigger encountered.

j. Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's numbering plan. This consideration only applies for MS to MS calls recognized as such by the MSC serving the calling MS.

The LocationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

LocationRequest RETURN RESULT Parameters				
Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ElectronicSerialNumber		M	2.112	a
MobileIdentificationNumber		M	2.140	a
MSCID (Serving MSC)		M	2.151	b
AccessDeniedReason		O	2.1	c
AnnouncementList		O	2.10	d
CallingPartyNumberString1		O	2.32	e
CallingPartyNumberString2		O	2.33	e
CDMAServiceOption		O	2.66	p
Digits (Carrier)		O	2.105	f, g
Digits (Destination)		O	2.105	g, h, s
DisplayText		O	2.106	e, r
DisplayText2		O	2.107	e, r
DMH_AccountCodeDigits		O	2.108	i
DMH_AlternateBillingDigits		O	2.109	i
DMH_BillingDigits		O	2.110	i
DMH_RedirectionIndicator		O	2.111	j
GroupInformation		O	2.124	k

IMSI	O	2.127	t
MobileDirectoryNumber	O	2.139	i
NoAnswerTime	O	2.165	l
OneTimeFeatureIndicator	O	2.167	m
PC_SSN (Serving MSC or VLR)	O	2.176	n
RedirectingNumberDigits	O	2.198	j
RedirectingNumberString	O	2.199	e
RedirectingSubaddress	O	2.201	e, j
RoutingDigits	O	2.209	f
TDMAServiceCode	O	2.273	q
TerminationList	O	2.280	o
TerminationTriggers	O	2.283	f
TriggerAddressList	O	2.286	f

Notes:

a. Value is all zeroes, if unknown.

b. Value is MSCID (Originating), if access is denied or routing to a directory number.

c. Include if access may be denied.

d. Include if one or more tones or announcements is to be applied to the calling party.

e. Include for local termination (e.g., the LocalTermination parameter is included within the TerminationList parameter) if a related feature is active.

f. Include if applicable.

g. Include if call is to be routed over a network.

h. Use only with system not capable of using the TerminationList parameter.

i. Include if available for recording purposes (see *DMH).*

j. Include if available and call redirection may apply.

k. Include for multi-leg calls.

l. Include to request an override of the Originating MSC's default *No Answer Time* value.

m. Include if modification to normal feature processing is required for a call in progress.

n. Include for possible screening by the Originating MSC for call redirection attempts on this leg.

o. Include if call routing is required.

p. Include to identify accepted CDMA service information.

q. Include to identify accepted TDMA service information.

r. Include only one of these mutually exclusive parameters.

s. Encode the Digits (Destination) as *International* if it is known that the Originating MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE) and an HLR stored number is being provided.

t. Include if available.

2.38 MessageDirective

The MessageDirective (MSGDIR) operation is used to update the message waiting information (e.g., type and count of messages waiting) in a mobile subscriber's HLR.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	VMS	HLR
Case 2	MC	HLR
Case 3	MSC (VMS Host System)	HLR
Case 4	VMS	MC

The MessageDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISION package. The Parameter Set is encoded as follows:

MessageDirective INVOKE Parameters				Timer: MDT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
MessageWaitingNotificationCount		O	2.136	a
MobileDirectoryNumber		O	2.139	b, c
MSID		O	2.153	b, c

Notes:

    a.   Include to indicate the type and number of messages waiting for the subscriber.

    b.   Include to identify the MS.

    c.   One of these parameters, but not both, must be included in each instance of the message.

The MessageDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

MessageDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				

2.39 MobileOnChannel

The MobileOnChannel (MSONCH) operation is invoked from the Target MSC to confirm the arrival of the MS on the new channel, and thus a successful handoff. The MobileOnChannel completes a transaction started with a FacilitiesDirective or a FacilitiesDirective2 operation invocation.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Target MSC	Serving MSC

The MobileOnChannel operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

MobileOnChannel INVOKE Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	zero octets	M	520-1.3.2.1	
Contents				

Note that a RETURN RESULT or a RETURN ERROR component is never expected in reply to the MobileOnChannel INVOKE message.

2.40 Modify

The Modify (MODIFY) operation is used by a service control function (SCF) to update data items stored in a remote service data function (SDF) that have been changed as a result of service logic processing.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	SCP or SN	SCP or SN
Case 2	SCP or SN	HLR
Case 3	HLR	SCP or SN

The Modify operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Modify INVOKE Parameters			Timer: MT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
DatabaseKey		M	2.91	a
ModificationRequestList		M	2.146	

Notes:

a. Parameter value is determined by bi-lateral negotiation between sender and receiver to be interpreted as a database key. For example, possible values might be mobile DN, mobile identification number, or a proprietary database key.

The Modify operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Modify RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ModificationResultList		M	2.148	a

Notes:

a. The ModificationResultList parameter contains one ModificationResult for each ModificationRequest in the ModificationRequestList parameter in the Modify INVOKE. Each of the ModificationResults corresponds to one of the ModificationRequests. The ModificationResults are included in the ModificationResultList in the same order as the corresponding ModificationRequests are included in the ModificationRequestList.

2.41   MSInactive

> This operation was named CSSInactive prior to revision *C* of *IS-41*.

The MSInactive (`MSINACT`) operation is used to indicate that an MS is inactive. The MSInactive operation is also used by the Serving VLR to notify the HLR of the cancellation of an MS's registration. The MSInactive operation is used by the HLR to provide the MS's CallHistoryCount to the AC when the SSD is shared with the VLR, and the VLR cancels the MS's registration.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR
Case 3	HLR	AC

The MSInactive operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The parameter set is encoded as follows:

MSInactive INVOKE Parameters			Timer: MSIT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	h
CallHistoryCount		O	2.26	a
DeregistrationType		O	2.101	b
DestinationDigits		O	2.103	g
LocationAreaID		O	2.135	c
SenderIdentificationNumber		O	2.215	d
ServicesResult		O	2.224	f
SMS_MessageWaitingIndicator		O	2.238	e

Notes:

a.   Include if MS registration is canceled and if the SSD is shared.

b.   Include from VLR to HLR and HLR to AC for MS deregistration.

c.   May be included from MSC-V to VLR. Usage in the HLR is not defined.

d.   May be included to identify the functional entity sending this message.

e.   Include to indicate that an SMS message is pending delivery.

f.   Include to indicate result of a PSID/RSID delivery to an MS.

g. Include when received from MS in De-registration.

h. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

The MSInactive operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

MSInactive RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				

2.42 NumberPortabilityRequest

The NumberPortabilityRequest (NPREQ) operation is used to request routing information when digit analysis indicates that the called Directory Number (DN) is a portable number.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	NPDB

The NPREQ operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

NumberPortabilityRequest INVOKE Parameters				Timer: NPT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
Digits (Dialed)		M	2.105	
CallingPartyNumberDigits1		O	2.30	a
MSCID		O	2.151	b
MSID (Originating)		O	2.153	a

Notes:

a. The inclusion of this parameter is no longer recommended.

b. Include to identify the MSC sending the query.

The NPREQ operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

NumberPortabilityRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
RoutingDigits		O	2.209	a

Notes:

a. Include to indicate the LRN. This parameter is required when the number has been ported.

2.43 OriginationRequest

The OriginationRequest (ORREQ) operation is used to request call origination treatment on behalf of a registered MS. It is also used for TDMA OTASP, where it may be sent by the MSC to the OTAF when an MS OTASP origination is received by the MSC. This OTASP origination may be initiated from either an unprogrammed or preprogrammed MS. An SCP may use the OriginationRequest (ORREQ) operation to obtain an IMS Routing address from a VCC AS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	HLR
Case 2 (Note 1)	Serving MSC	OTAF
Case 3	HLR	SCP
Case 4	Serving MSC	SCP
Case 5	SCP	VCC AS

Notes:

Note 1 is only applicable to TDMA OTASP.

The OriginationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

OriginationRequest INVOKE Parameters			Timer: ORT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (originating)		M	2.23	
Digits (Dialed)		M	2.105	
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	g
MSCID (Originating MSC)		M	2.151	
OriginationTriggers		M	2.169	
TransactionCapability		M	2.285	
CallingPartyName		O	2.29	h
CallingPartyNumberDigits1		O	2.30	a, m
CallingPartyNumberDigits2		O	2.31	a, m
CallingPartySubaddress		O	2.34	a
CDMAServiceOption		O	2.66	n
LocationAreaID		O	2.135	a

MobileDirectoryNumber	O	2.139	b
MobileIdentificationNumber	O	2.140	p
MSCIdentificationNumber	O	2.152	c
OneTimeFeatureIndicator	O	2.167	d
PC_SSN (Originating MSC)	O	2.176	e
PreferredLanguageIndicator	O	2.179	k
SenderIdentificationNumber	O	2.215	f
ServingCellID	O	2.225	a
SMS_Address	O	2.232	i
SystemCapabilities	O	2.259	j
SystemMyTypeCode (originating MSC)	O	2.260	q
TriggerType	O	2.289	l
TDMAServiceCode	O	2.273	o
WINCapability	O	2.299	a

Notes:

a. Include if applicable.

b. Include if available for recording purposes (see *DMH)*.

c. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

d. Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

e. Include if SS7 may be used for subsequent call redirection.

f. Include if different from the MSCIdentificationNumber to identify the functional entity sending the message.

g. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

h. Include if calling party name information is known.

i. Include for TDMA OTASP call origination if routing of teleservice message is applicable.

j. Include for TDMA OTASP call origination if the system is capable of authentication, voice privacy and signaling message encryption.

k. Include if available.

l. Include to identify the trigger encountered.

m. Send only the National (Significant) Number (with Nature of Number set to *National*) if the E.164 country code of the caller's number matches the E.164 country code used for numbers from the MSC's Country's Numbering Plan.

n. Include to specify requested CDMA service information.

o. Include to specify requested TDMA service information.

p. Include if known and if the IMSI has been included as MSID.

q. Include if available to identify the originating system manufacturer.

The OriginationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

OriginationRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AnnouncementList		O	2.10	c
CallingPartyNumberString1		O	2.32	d, e
CallingPartyNumberString2		O	2.33	d, e
CallingPartySubaddress		O	2.34	d, e, f
CarrierDigits		O	2.37	g
Digits (Dialed)		O	2.105	h
DisplayText		O	2.106	d, e, r
DisplayText2		O	2.107	d, e, r
DMH_AccountCodeDigits		O	2.108	i
DMH_AlternateBillingDigits		O	2.109	i
DMH_BillingDigits		O	2.110	i
DMH_RedirectionIndicator		O	2.111	i, j
GroupInformation		O	2.124	k
MobileDirectoryNumber		O	2.139	i
NoAnswerTime		O	2.165	l
OneTimeFeatureIndicator		O	2.167	m
PilotNumber		O	2.178	k
PreferredLanguageIndicator		O	2.179	s, t
RedirectingNumberDigits		O	2.198	f
RedirectingNumberString		O	2.199	d
RedirectingSubaddress		O	2.201	d, e
RoutingDigits		O	2.209	g
TerminationList		O	2.280	n
TerminationTriggers		O	2.283	o
TriggerAddressList		O	2.286	q

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if one or more tones or announcements are to be applied to the MS.

d. Include if a LocalTermination parameter is included in the TerminationList parameter.

e. Include if the related feature is active.

f. Include if a PSTNTermination parameter or an IntersystemTermination parameter is included within the TerminationList parameter.

g. Include if applicable.

h. Include if digits remain to be translated by the MSC. Encode the Digits (Dialed) as *International* if:

- The digits being returned are the results of a stored translation of the termination address into a destination address (e.g., the expansion of an abbreviated dialing string), and

- the serving MSC is known to be capable of accepting digits in International format (e.g., the MSCIdentificationNumber parameter was received) in the corresponding INVOKE.

i. Include if available for recording purposes (see *DMH*).

j. Include if redirection may apply.

k. Include for multi-leg calls.

l. Include to request an override of the Serving MSC's default *No Answer Time* value.

m. Include if modification to normal feature processing is required for the call in progress.

n. Include if call routing is required.

o. Include to indicate processing in the Originating MSC for failed call attempts.

p. Intentionally left for future modifications.

q. Include to indicate address associated with active WIN triggers.

r. Include only one of these mutually exclusive parameters.

s. Include to identify the Preferred Language.

t. This parameter may only be included if the AnnouncementList parameter is present.

OriginationRequest

2.44   OTASPRequest

The OTASPRequest (OTASPREQ) operation is used by the OTAF to request the initiation of certain AC procedures (such as A-key Generation, SSD Update and Commit or Release a temporary A-key, etc.), and to also return certain parameters.

The following table lists the valid combinations of invoking and responding FEs:

	INVOKING FE	RESPONDING FE
Case 1	OTAF	HLR
Case 2	HLR	AC

The OTASPRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

OTASPRequest INVOKE Parameters				Timer: OTART
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ActionCode		O	2.2	a
AKeyProtocolVersion		O	2.3	b
AuthenticationData		O	2.13	c
AuthenticationResponse		O	2.14	c
CallHistoryCount		O	2.26	c
ElectronicSerialNumber		O	2.112	d
MSID		O	2.153	d, e
MobileStationMSID		O	2.143	f
MobileStationPartialKey		O	2.144	g
MSCID (Serving MSC)		O	2.151	h, n
NewlyAssignedMSID		O	2.161	i, o
PC_SSN		O	2.176	n
RandomVariable		O	2.189	c
RandomVariableBaseStation		O	2.190	m
ServiceIndicator		O	2.221	j
SystemCapabilities		O	2.259	k
TerminalType		O	2.278	l

Notes:

a.   Include to identify action to be performed.

b. Include for CDMA OTAPA to identify available version(s) of A-key Generation procedure(s) at the MS if the generation of public encryption values is being requested. Include for TDMA OTA to specify the A-Key protocol version supported if the action code indicates an A-Key operation.

c. Received from the MS during CDMA OTASP (or CDMA OTAPA) in the *Re-Authenticate Response* OTASP Data Message. Include for CDMA OTASP or CDMA OTAPA when re-authenticating the MS.

d. Include to identify the MS.

e. For CDMA OTASP, contains the Activation_MIN. For CDMA OTAPA, contains the MS's MSID at the start of the OTAPA session. IF the MS has both a MIN and an IMSI at the start of the OTAPA session then the MIN form of the MSID is used.
For TDMA OTA, the MSID parameter contains either the MS generated Activation_MIN, or the MS's real MIN or IMSI, as applicable.

f. Include for CDMA OTASP but not for CDMA OTAPA. Only use the MobileStationIMSI form of the MobileStationMSID if the IMSI_T was received from the MS at OTASP call origination and a MIN is not programmed in the MS.[1]

g. Include for CDMA OTASP or CDMA OTAPA if A-key is to be generated. Include for TDMA OTA if the MS partial key is being supplied to the AC.

h. Include for CDMA OTASP to identify the Serving System if either SSD Update or Reauthentication is being requested. (Not available for OTAPA).

i. Include for CDMA OTASP or CDMA OTAPA if the ActionCode indicates *Commit A-Key* and if a new MIN has been assigned to the MS or, for an MS that has no MIN programmed (or whose MIN is being erased),[2] if a new IMSI has been assigned to the MS.[3] Otherwise this parameter is not included. The NEWMIN form of this parameter should be used if both a new MIN and a new IMSI are assigned to the MS.

j. Include for CDMA OTASP, CDMA OTAPA and TDMA OTASP.

k. Include for CDMA OTASP to identify the serving system's authentication capabilities.

l. The MS's Terminal Type. Include for CDMA OTASP or CDMA OTAPA, if needed by the AC, when the ActionCode indicates *Commit A-key*. [Refer to CDMA and AUTH]

m. Include for CDMA OTAPA, when the ActionCode indicates *Generate Authentication Signature*, to transport the RAND_OTAPA to the AC.

n. Include for TDMA OTA to specify the address of the MSC if the initiation of an AC procedure (as specified by the ACTCODE) is being requested.
For MSCIDs, the HLR may translate the MSCID into the appropriate (e.g., SS7, X.25)

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[1] It may be necessary to upload a NAM parameter block to determine this for an unknown MS. (For CDMA OTASP, if the OTAF initiates an SSD update, the AC uses the received MS_MSID to calculate AUTHU whereas the MS uses its MIN, if one is programmed. If a MIN is programmed in the MS, the SSD update cannot succeed unless the MS_MSID provides that MIN to the AC.)

[2] It may be necessary to upload a NAM parameter block to determine this for an unknown MS that has initiated a CDMA OTASP session.

[3] A new MIN must be assigned to replace the existing MIN or the existing MIN must be erased from memory for an unknown MS that has a previously programmed MIN. (Otherwise, the MS would use that old MIN for its authentication calculations, but the AC would not have that old MIN available for its authentication calculations.)

address variant. In the case when one VLR serves multiple MSCs, the HLR will include this address in the message being forwarded toward the MSC (from the AC). The HLR will use this address to route to the VLR. The VLR will use this address to route to the appropriate MSC. The VLR will not include this address in the message to MSC.

o. Include for TDMA OTASP to specify the MSID that will be assigned to the MS, as a result of this OTASP session, if the MIN parameter contains as activation MIN.

The OTASPRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

OTASPRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AKeyProtocolVersion		O	2.3	a
AuthenticationResponseBaseStation		O	2.15	g
BaseStationPartialKey		O	2.22	b
DenyAccess		O	2.100	c
EnhancedPrivacyEncryptionReport		O	2.114	h
ModulusValue		O	2.149	b
OTASP_ResultCode		O	2.170	d
PrimitiveValue		O	2.180	b
SignalingMessageEncryptionReport		O	2.229	e
SSDUpdateReport		O	2.254	f
UniqueChallengeReport		O	2.291	f
VoicePrivacyReport		O	2.298	e

Notes:

a. Included to indicate the selected A-key generation protocol procedure.

b. Include for CDMA to return Public Encryption Values to the OTAF.
Include for TDMA if the public encryption values are known

c. Include for CDMA OTA to convey authentication failure or count mismatch during the Re-Authentication procedure.

d. Include for CDMA to convey information other than what can be conveyed in the DenyAccess, UniqueChallengeReport, SSDUpdateReport, SignalingMessageEncryptionReport, and the VoicePrivacyReport parameters.
Include for TDMA if the OTASP result code is known.

e. Include for CDMA to convey the values received by the AC in the AuthenticationStatusReport INVOKE during the Re-Authentication procedure. Include for TDMA to convey the values received by the AC in the AuthenticationStatusReport INVOKE during the SSD update and re-authentication procedures.

f. Include for CDMA to convey the values received by the AC in the AuthenticationStatusReport INVOKE during the SSD update procedure.
Include for TDMA to convey the values received by the AC in the AuthenticationStatusReport INVOKE during the SSD update and re-authentication procedures.

g. Include for CDMA OTAPA to transport the AUTH_OTAPA, the authentication signature value generated by the AC, to the OTAF.

h. Include if report related to TDMA Enhanced Privacy and Encryption.

2.45   ParameterRequest

The Parameter Request (PARMREQ) operation is used to obtain the required parameters associated with the MS.

The following table lists the valid combinations of invoking and responding FEs:

	INVOKING FE	RESPONDING FE
Case 1	New Serving VLR	Old Serving VLR
Case 2	Serving MSC	Serving VLR

One of two possible results is returned:

1.   The ParameterRequest operation is successful.

2.   Notification that ParameterRequest is unsuccessful with an appropriate denied reason.

The ParameterRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

ParameterRequest INVOKE Parameters			Timer: PRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
RequiredParametersMask		M	2.205	
ElectronicSerialNumber		O	2.112	a
MSID		O	2.153	b
MSCID		O	2.151	c
NetworkTMSI		O	2.158	b
PC_SSN		O	2.176	d
SenderIdentificationNumber		O	2.215	e
SystemMyTypeCode		O	2.260	f

Notes:

a.   Include if appropriate.

b.   Include to identify the MS; at least one should be provided.

c.   Include to identify initiating MSC.

d.   Include if SS7 is used.

e.   May be included to identify the functional entity sending this message.

f.   Include to identify the originating system manufacturer.

The ParameterRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

ParameterRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ElectronicSerialNumber		O	2.112	a
IMSI		O	2.127	a
LocationAreaID		O	2.135	a
MobileIdentificationNumber		O	2.140	a
NetworkTMSI		O	2.158	a
ReasonList		O	2.195	b

Notes:

a.   Include as indicated in RequiredParametersMask received in the ParameterRequest Invoke.

b.   Include if the required parameters are unavailable.

2.46 QualificationDirective

The QualificationDirective (QUALDIR) operation is used to update the authorization information, profile information, or both, previously obtained for an MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	Serving VLR
Case 2	Serving VLR	Serving MSC

The QualificationDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

QualificationDirective INVOKE Parameters			Timer: QDT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	j
QualificationInformationCode		M	2.187	
SystemMyTypeCode (HLR or VLR)		M	2.260	
AnalogRedirectRecord		O	2.8	l
AuthorizationDenied		O	2.18	a
AuthorizationPeriod		O	2.19	b
CDMARedirectRecord		O	2.62	m
ControlChannelMode		O	2.87	k
DeniedAuthorizationPeriod		O	2.99	c
Digits (Carrier)		O	2.105	d, e
Digits (Destination)		O	2.105	d, f, p
LocationAreaID		O	2.135	g
Profile **Macro**		O	2.182	h, q
RoamingIndication		O	2.208	n
SenderIdentificationNumber		O	2.215	i
ServiceRedirectionInfo		O	2.223	l, m, o

Notes:

a.   If included, no other optional parameters except the DeniedAuthorizationPeriod parameter shall be present.

b.   Include if validation is being updated.

c.   May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

d.   Use only on systems not capable of supporting the TransactionCapability parameter.

e.   Include if profile is being updated and preferred carrier is applicable.

f.   Include if profile is being updated and originations are restricted to selected leading digits of a directory number or of an international E.164 number (e.g., set to NPA-NXX to restrict originations to a 6-digit NANP office code or set to NPA-NXX-XXXX to restrict originations to a single NANP directory number).

g.   May be included from VLR to Serving MSC. Usage from the HLR is not defined.

h.   Include applicable parameter(s) (see 2.182).

i.   May be included to identify the functional entity sending the message.

j.   The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System; otherwise the HLR includes the MobileIdentificationNumber type of MSID. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received from the HLR.

k.   Include if MS is Digital Control Channel capable, to indicate the last known access mode.

l.   Include for NDSS if HLR is to redirect the MS to an analog system.

m.   Include for NDSS if HLR is to redirect the MS to a CDMA system.

n.   Include for CDMA to support Enhanced Roaming Indicator.

o.   Include if the MS NDSS feature is to be suppressed or activated.

p.   Encode the Digits (Destination) as *International* if it is known that the serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received during registration).

q.   The DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is known that the serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received during registration).

The QualificationDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

QualificationDirective RETURN RESULT Parameters				
Field	Value	Type	Reference	Notes
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.47 QualificationRequest

The QualificationRequest (`QUALREQ`) operation is used (a) to request validation of an MS, (b) to request an MS's profile information, or (c) both.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR

The QualificationRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

QualificationRequest INVOKE Parameters				Timer: QRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	c
QualificationInformationCode		M	2.187	
SystemMyTypeCode (MSC or VLR)		M	2.260	
CDMANetworkIdentification (Serving)		O	2.57	i
ControlChannelMode		O	2.87	j
LocationAreaID		O	2.135	d
MSCID (Serving MSC or Originating MSC)		O	2.151	a
MSCIdentificationNumber		O	2.152	m
ServiceRedirectionCause		O	2.222	k
SenderIdentificationNumber		O	2.215	b
SystemAccessType		O	2.258	a
TerminalType		O	2.278	j
TransactionCapability		O	2.285	a, f, l
UserGroup		O	2.293	e
UserZoneData		O	2.294	g
WINCapability		O	2.299	h

Notes:

a.   Should be included on *IS-41-C* or later.

b.   May be included to identify the functional entity sending the message.

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c. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

d. May be included from MSC to VLR.

e. Include if a change in the allocation status of a User Group is requested by the MS user.

f. Include if system is User Zone capable.

g. Include to indicate the UZID indicated by the subscriber's chosen PSID/RSID.

h. Include to identify the WIN capabilities supported.

i. Include for NDSS to identify the serving network.

j. Include for NDSS to identify the operating mode of the MS.

k. Include for NDSS to indicate reason for MS registration or access.

l. Include if the system is NDSS capable.

m. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

The QualificationRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

QualificationRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SystemMyTypeCode (VLR or HLR)		M	2.260	
AnalogRedirectRecord		O	2.8	i
AuthorizationDenied		O	2.18	a
AuthorizationPeriod		O	2.19	b
CDMARedirectRecord		O	2.62	j
ControlChannelMode		O	2.87	h
DeniedAuthorizationPeriod		O	2.99	c
Digits (Carrier)		O	2.105	d
Digits (Destination)		O	2.105	e, l
MSCID (HLR)		O	2.151	f
Profile **Macro**		O	2.182	g, m
RoamingIndication		O	2.208	k
ServiceRedirectionInfo		O	2.223	i, j

Notes:

a. If included, no other optional parameter except the DeniedAuthorizationPeriod parameter shall be present.

b. Include if validation requested.

c. May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

d. Include if profile requested and preferred carrier is applicable and TransactionCapability parameter is not received.

e. Include if profile requested and originations are restricted to selected leading digits of directory numbers or of international E.164 numbers, (e.g., NPA-NXX or NPA-NXX-XXXX for NANP) and TransactionCapability parameter is not received.

f. Include on *IS-41-C* and later and authorization is not denied.

g. Include applicable parameter(s) (see 2.182).

h. Include if the MS is Digital Control Channel capable, to indicate the last known access mode.

i. Include for NDSS if HLR is to redirect the MS to an analog system.

j. Include for NDSS if HLR is to redirect the MS to a CDMA system.

k. Include for CDMA to support Enhanced Roaming Indicator.

l. Encode the Digits (Destination) as *International* if it is known that the serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

m. The DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is know that the serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

2.48 QualificationRequest2

The QualificationRequest2 operation is used (a) to request validation of an MS, (b) to request an MS's profile information, or (c) both.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Serving VLR
Case 2	Serving VLR	HLR

The QualificationRequest2 operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

QualificationRequest2 INVOKE Parameters			Timer: QRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
MSCID (Serving MSC or Originating MSC)		M	2.154	
QualificationInformationCode		M	2.190	
SystemAccessType		M	2.261	
SystemMyTypeCode (MSC or VLR)		M	2.263	
TransactionCapability		M	2.288	a
CDMANetworkIdentification (Serving)		O	2.58	b
ControlChannelMode		O	2.88	c
ElectronicSerialNumber		O	2.113	d
LocationAreaID		O	2.138	e
MobileDirectoryNumber		O	2.142	f
MSCIdentificationNumber		O	2.155	g
MSID		O	2.156	d, h
NonPublicData		O	2.169	
ServiceRedirectionCause		O	2.225	i
SenderIdentificationNumber		O	2.218	j
TerminalType		O	2.281	k
UserGroup		O	2.297	l
UserZoneData		O	2.298	m
WINCapability		O	2.303	n

Notes:

 a. Include if system is User Zone capable.

 b. Include for NDSS to identify the serving network.

 c. Include for NDSS to identify the operating mode of the MS.

 d. Include if known (e.g., not an MDN-based request).

 e. May be included from MSC to VLR.

 f. Include if this is a request for validation and profile based on a subscriber's MDN.

 g. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

 h. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

 i. Include for NDSS to indicate reason of MS registration or access.

 j. Include to identify the functional entity sending the message.

 k. Include if the system is NDSS capable.

 l. Include if a change in the allocation status of a User Group is requested by the MS user.

 m. Include to indicate the UZID indicated by the subscriber's chosen PSID/RSID.

 n. Include to identify the WIN capabilities supported.

The QualificationRequest2 operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

QualificationRequest2 RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SystemMyTypeCode (VLR or HLR)		M	2.263	
AnalogRedirectRecord		O	2.8	a
AuthorizationDenied		O	2.19	b
AuthorizationPeriod		O	2.20	c
CDMARedirectRecord		O	2.63	d
ControlChannelMode		O	2.88	e
DeniedAuthorizationPeriod		O	2.100	f
Digits (Carrier)		O	2.106	g
Digits (Destination)		O	2.106	h, i
ElectronicSerialNumber		O	2.113	j
IMSI		O	2.130	k
MobileIdentificationNumber		O	2.143	k
MSCID (HLR)		O	2.154	l
Profile **Macro**		O	2.185	m, n
RoamingIndication		O	2.211	o
ServiceRedirectionInfo		O	2.226	a, d

Notes:

a.   Include for NDSS if HLR is to redirect the MS to an analog system.

b.   If included, no other optional parameters except the DeniedAuthorizationPeriod parameter shall be present.

c.   Include if validation requested.

d.   Include for NDSS if HLR is to redirect the MS to a CDMA system.

e.   Include if the MS is Digital Control Channel capable, to indicate the last known access mode.

f.   May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

g.   Include if profile requested and preferred carrier is applicable and TransactionCapability parameter is not received.

h.   Include if profile requested and originations are restricted to selected leading digits of directory numbers or of international E.164 numbers, (e.g., NPA-NXX or NPA-NXX-XXXX for NANP) and TransactionCapability parameter is not received.

i. Encode the Digits (Destination) as *International* if it is known that the serving MSC can accept the digits in this format (e.g. the MSCIdentificationNumber parameter was received in the INVOKE).

j. Include if available.

k. Include if available. At least one shall be included.

l. Include if authorization is not denied.

m. Include applicable parameter(s) (see 2.185).

n. The DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is know that the serving MSC can accept them in this format (e.g. the MSCIdentificationNumber parameter was received in the INVOKE).

o. Include for CDMA to support Enhanced Roaming Indicator.

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2.49   RandomVariableRequest

The RandomVariableRequest (RANDREQ) operation is used by the Serving MSC to request the value of RAND from a Border MSC corresponding to the RANDC received from an MS. This operation may be used if the value of RANDC received from an MS corresponds to a RAND value that may be transmitted by a Border MSC which is transmitting the same SID as the Serving MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Border MSC

The RandomVariableRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RandomVariableRequest INVOKE Parameters				Timer: RANDRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
MSCID (Serving MSC)		M	2.151	
RANDC		M	2.188	
ServingCellID		M	2.225	

The RandomVariableRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RandomVariableRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
RandomVariable		M	2.189	a
RANDValidTime		M	2.194	a

Notes:

a.   Include only when the RANDC received in the INVOKE can be associated with a currently or recently transmitted RAND.

2.50 RedirectionDirective

The RedirectionDirective (REDDIR) operation is used during feature processing to direct the MSC to forward the indicated call.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Adjunct MSC	Originating MSC

The RedirectionDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RedirectionDirective INVOKE Parameters			Timer: RDT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Originating)		M	2.23	
Digits (Destination)		M	2.105	
ElectronicSerialNumber		M	2.112	
SystemMyTypeCode (MSC)		M	2.260	
Digits (Carrier)		O	2.105	a
DMH_AccountCodeDigits		O	2.108	b
DMH_AlternateBillingDigits		O	2.109	b
DMH_BillingDigits		O	2.110	b
IMSI		O	2.127	f
MobileIdentificationNumber		O	2.140	f
MSCIdentificationNumber		O	2.152	c
RedirectingNumberString		O	2.199	d
RedirectingSubaddress		O	2.201	d
SenderIdentificationNumber		O	2.215	e

Notes:

a. Include if applicable.

b. Include if available for recording purposes (see *DMH*).

c. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

d. Optionally, include to override normal Originating MSC redirection number treatment.

e. Include if different from the MSCIdentificationNumber to identify the functional entity sending the message.

f. Include if available. At least one of these parameters should be present.

The RedirectionDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RedirectionDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.51 RedirectionRequest

The RedirectionRequest (REDREQ) operation is used by the Serving MSC to request redirection of a call by the Originating MSC.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Originating MSC

The RedirectionRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RedirectionRequest INVOKE Parameters				Timer: RDRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Originating)		M	2.23	
ElectronicSerialNumber		M	2.112	
RedirectionReason		M	2.202	
AnnouncementList		O	2.10	f, g
CDMAServiceOption		O	2.66	d
CommandCode		O	2.82	h
IMSI		O	2.127	c
LegInformation		O	2.133	a
MobileIdentificationNumber		O	2.140	c
MSCIdentificationNumber		O	2.152	b
PreferredLanguageIndicator		O	2.179	g, i
TDMAServiceCode		O	2.273	e

Notes:

a. Include if available (i.e., if provided in the associated RoutingRequest INVOKE component).

b. Include to identify Serving MSC.

c. Include if available. At least one of these parameters should be present.

d. Include if CDMA channel is in use to allow distinctive forwarding based on Service Type.

e. Include if TDMA channel is in use to allow distinctive forwarding based on Service Type.

f. Include to direct the Originating MSC to provide tone or announcement. If present, AnnouncementList is used (instead of the RedirectionReason) to generate Originating System announcements to the calling party.

g.   Include only if available and CommandCode is also included.

h.   Include to allow/deny the Originating System to initiate a TRANUMREQ towards the HLR. Absence of CommandCode should default to allow TRANUMREQ.

i.   Include to specify the called party's preferred language.

The RedirectionRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RedirectionRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.52　RegistrationCancellation

The RegistrationCancellation (REGCAN) operation is used to report, to the responding FE, that a previously registered MS is no longer in its serving area. The VLR may possess additional information which allows it to determine that the RegistrationCancellation INVOKE is invalid, thereby causing the VLR to deny the cancellation.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	prior Serving VLR
Case 2	prior Serving VLR	prior Serving MSC

The RegistrationCancellation operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RegistrationCancellation INVOKE Parameters			Timer: RCT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	d
CancellationType		O	2.36	a
ControlChannelData		O	2.86	b
ReceivedSignalQuality		O	2.197	b
SenderIdentificationNumber		O	2.215	c
SystemAccessData		O	2.257	b

Notes:

a. Include if applicable.

b. Include if registration cancellation is the result of multiple access arbitration.

c. May be included to identify the functional entity sending the message.

d. The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System; otherwise the HLR includes the MobileIdentificationNumber type of MSID. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received form the HLR.

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The RegistrationCancellation operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RegistrationCancellation RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
CallHistoryCount		O	2.26	a
CancellationDenied		O	2.35	b
ControlChannelData		O	2.86	b
ReceivedSignalQuality		O	2.197	b
SMS_MessageWaitingIndicator		O	2.238	c
SystemAccessData		O	2.257	b

Notes:

a.   Include if SSD is shared.

b.   Include if registration cancellation is denied.

c.   Include to indicate that an SMS message is pending delivery.

2.53 RegistrationNotification

The RegistrationNotification (REGNOT) operation is used to report the location of an MS and, optionally, to (a) validate the MS or (b) validate the MS and obtain its profile information. It is also used for delivering the Serving MSC's routing address to the desired OTAF in support of TDMA OTASP.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving (or Bordering) MSC	Serving (or Bordering) VLR
Case 2	Serving (or Bordering) VLR	HLR
Case 3 (Note 1)	Serving VLR	OTAF

Note:

1.   Case 3 is only applicable to TDMA OTASP.

The RegistrationNotification operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RegistrationNotification INVOKE Parameters			Timer: RNT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	l
MSCID (Serving MSC)		M	2.151	
QualificationInformationCode		M	2.187	
SystemMyTypeCode (Serving MSC or VLR)		M	2.260	
AvailabilityType		O	2.20	a
BorderCellAccess		O	2.24	b
CDMANetworkIdentification (Serving)		O	2.57	q
ControlChannelData		O	2.86	b
ControlChannelMode		O	2.87	n, r
ExtendedMSCID (VLR)		O	2.116	c
LocationAreaID		O	2.135	d
MSC_Address		O	2.150	m
MSCIdentificationNumber (Serving MSC)		O	2.152	t
PC_SSN (Serving MSC or VLR)		O	2.176	e
ReceivedSignalQuality		O	2.197	b
ReportType		O	2.204	f

SenderIdentificationNumber	O	2.215	g
ServiceRedirectionCause	O	2.222	s
SMS_Address	O	2.232	h
SMS_MessageWaitingIndicator	O	2.238	i
SystemAccessData	O	2.257	b
SystemAccessType	O	2.258	j
SystemCapabilities	O	2.259	k
TerminalType	O	2.278	j
TransactionCapability	O	2.285	j
UserGroup	O	2.293	o
WINCapability	O	2.299	p

Notes:

a. Include when MS is predictably unavailable for Call Delivery (e.g., slotted mode or sleep mode).

b. Include if access occurred in a border cell (based on internal algorithms).

c. Included by VLR if its MSCID is different than the MSC's MSCID.

d. May be included from MSC to VLR.

e. Include to override lower layer addressing if the receiving VLR or HLR is known to be in the same national SS7 network.

f. Include if authentication parameters were requested by the Serving MSC (AUTH=1 in the Overhead Message Train) but were not received from the MS for the system access.

g. May be included to identify message sender.

h. Include to indicate that the Serving MSC supports Short Message Service, or, for TDMA, that the Serving MSC supports teleservice message delivery (e.g., CMT, OATS).

i. Include if the MS was previously registered with this VLR, the MS is registering to a new serving MSC that does not support SMS, and an SMS message is pending delivery in the previous serving system. This is only used between a VLR and an HLR.

j. Include on *IS-41-C* and later.

k. Include if the system is authentication capable (including voice channel authentication only systems where all flags are zero).

l. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

m. Include for CDMA OTA, if the Serving MSC does not support SMS but does support any other service (e.g., CDMA OTAPA) which needs to convey the current routing address of the Serving MSC.

n. Include if the MS is Digital Control Channel capable to indicate whether an analog or digital control channel was used by the MS in this access.

o.   Include if a change in allocation status of a User Group is requested by the MS user.

p.   Include to identify the WIN capabilities supported.

q.   Include for NDSS to identify the serving network.

r.   Include for NDSS to identify the operating mode of the MS.

s.   Include for NDSS to indicate reason of MS registration or access.

t.   Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

The RegistrationNotification operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RegistrationNotification RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SystemMyTypeCode (VLR or HLR)		M	2.260	
AnalogRedirectRecord		O	2.8	a
AuthorizationDenied		O	2.18	b
AuthorizationPeriod		O	2.19	c
CDMARedirectRecord		O	2.62	d
ControlChannelData		O	2.86	e
DeniedAuthorizationPeriod		O	2.99	f
Digits (Carrier)		O	2.105	g
Digits (Destination)		O	2.105	h, i
MINExtension		O	2.148	j
MSCID (HLR)		O	2.151	k
MSID		O	2.153	l
Profile **Macro**		O	2.182	m, n
ReceivedSignalQuality		O	2.197	e
RoamingIndication		O	2.208	o
SenderIdentificationNumber		O	2.215	p
ServiceRedirectionInfo		O	2.223	a, d
SMS_MessageWaitingIndicator		O	2.238	q
SystemAccessData		O	2.257	e

Notes:
a.   Include for NDSS if HLR is to redirect the MS to an analog system.

b.   If included, only the ControlChannelData, DeniedAuthorizationPeriod, Received-SignalQuality, and SystemAccessData optional parameters have significance.

c.   Include if validation requested.

d.   Include for NDSS if HLR is to redirect the MS to a CDMA system.

e.   Include if AuthorizationDenied parameter is included with value of *Multiple Access*.

f.   May be included if the AuthorizationDenied parameter is present to indicate the interval before re-authorization may be attempted.

g.   Include if the profile is requested, the preferred carrier is applicable, and the CarrierDigits parameter is not included in the Profile macro.

h.   Include if profile requested and originations are restricted to selected leading digits of directory numbers or of international E.164 numbers, (e.g., NPA-NXX or NPA-NXX-XXXX for NANP) and TransactionCapability parameter is not received.

i.   Encode the Digits (Destination) as *International* if it is known that the serving MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

j.   Include if available and the *MX* field in the *TransactionCapability* parameter in the corresponding REGNOT was set to 1.

k.   Include on *IS-41-C* and later and authorization is not denied.

l.   Include MIN if available and IMSI was included in INVOKE. Include IMSI if available and MIN was included in INVOKE.

m.   Include applicable parameter(s) (see 2.182).

n.   The DMH_BillingDigits, MobileDirectoryNumber and RestrictionDigits parameters should be encoded as *International* when loaded into the profile if it is known that the serving MSC can accept them in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE).

o.   Include for CDMA to support Enhanced Roaming Indicator.

p.   May be included to identify the functional entity sending the message.

q.   Include to indicate that an SMS message is pending delivery.

RegistrationNotification

2.54　Release

The Release (RELEASE) operation is used to request the release of paging resources associated to an MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The Release operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISION package. The Parameter Set is encoded as follows:

Release INVOKE Parameters				Timer: RELT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
IMSI		O	2.127	a
MobileIdentificationNumber		O	2.140	a

Notes:

　　a.　Include if available. At least one of these parameters should be present

The Release operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Release RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				

2.55 RemoteUserInteractionDirective

The RemoteUserInteractionDirective (RUIDIR) operation is used by the HLR, SCP or SN to remotely direct the operation of an MSC (or other functional entity) which provides user interaction; i.e., the RUI-MSC. The RUI-MSC may be an Originating MSC, a Serving MSC or some other functional entity capable of user interaction. The RemoteUserInteractionDirective may be passed through an intervening HLR, SCP or SN when a ServiceRequest has been used to invoke service logic on another network element.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR or SCP or SN	RUI-MSC
Case 2	SCP or SN	HLR or SCP or SN
Case 3	HLR	SCP or SN

The RemoteUserInteractionDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

RemoteUserInteractionDirective INVOKE Parameters			Timer: RUDT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
AnnouncementList		M	2.10	
DigitCollectionControl		M	2.104	

The RemoteUserInteractionDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

RemoteUserInteractionDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
Digits (Dialed)		O	2.105	a

Notes:

a.   Include if call has not been abandoned. The number of digits returned may be zero, implying that the user did not dial before time-out.

2.56   ResetCircuit

The ResetCircuit (`RESETCKT`) operation is used by an MSC to restore information about circuit conditions which has been lost due to, for example, a restart. It may also be used to when placing circuits into service.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The ResetCircuit operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

ResetCircuit INVOKE Parameters				Timer: RSTT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	

The ResetCircuit operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

ResetCircuit RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
TrunkStatus		M	2.290	

2.57   ResetTimer

The ResetTimer (`RESETTIMER`) operation is used by the SCF to initialize and start an operation timer and avoid the timeout that would otherwise occur.

The following table lists the valid invoking FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR or SCP or SN	MSC
Case 2	HLR	SCP or SN
Case 3	SCP or SN	HLR or SCP or SN

The ResetTimer operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

ResetTimer INVOKE Parameters				Timer: (note a)	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					

Notes:

a.   When the SSF network entity (MSC) receives the ResetTimer INVOKE, it initializes and starts the active Service Switching Function Timer (SSFT). When an intervening SCF network entity receives the ResetTimer INVOKE, it sends a ResetTimer INVOKE to the MSC, and initializes and starts the active Service Control Function Timer (SCFT).

2.58 RoutingRequest

The RoutingRequest (ROUTREQ) operation is used to inquire as to the preferred method of routing a pending call to the identified MS.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	Serving VLR
Case 2	Serving VLR	Serving MSC
Case 3 (Note 1)	HLR	Serving MSC

Note:

1. Case 3 above is termed a 'direct' RoutingRequest operation, since it occurs directly between the HLR and the Serving MSC without the involvement of the VLR (e.g., voice mail delivery, voice mail storage, special dialogue).

The RoutingRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

RoutingRequest INVOKE Parameters			Timer: RRT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Originating)		M	2.23	a
ElectronicSerialNumber		M	2.112	
MSCID (Originating MSC)		M	2.151	
SystemMyTypeCode (Originating MSC)		M	2.260	
AlertCode		O	2.4	b
CallingPartyName		O	2.29	x
CallingPartyNumberDigits1		O	2.30	c, aa
CallingPartyNumberDigits2		O	2.31	c, aa
CallingPartyNumberString1		O	2.32	c, aa
CallingPartyNumberString2		O	2.33	c, aa
CallingPartySubaddress		O	2.34	c
ControlChannelMode		O	2.87	s
CDMAServiceOption		O	2.66	v
DestinationDigits		O	2.103	d, e
DisplayText		O	2.106	c, ac
DisplayText2		O	2.107	c, ac
DMH_AccountCodeDigits		O	2.108	f

DMH_AlternateBillingDigits	O	2.109	f
DMH_BillingDigits	O	2.110	f
LegInformation	O	2.133	g
LocationAreaID	O	2.135	f, h
MobileDirectoryNumber	O	2.139	f
MSID	O	2.153	t, r
MSCIdentificationNumber	O	2.152	i
NoAnswerTime	O	2.165	j
OneTimeFeatureIndicator	O	2.167	k
PC_SSN (Originating MSC)	O	2.176	l
PilotBillingID	O	2.177	m
PilotNumber	O	2.178	m
RedirectingNumberDigits	O	2.198	c, aa
RedirectingNumberString	O	2.199	c, aa
RedirectingPartyName	O	2.200	z
RedirectingSubaddress	O	2.201	c
SenderIdentificationNumber	O	2.215	n
TDMAServiceCode	O	2.273	w
TerminationTreatment	O	2.282	o
TerminationTriggers	O	2.283	f, ad
TransactionCapability (Originating MSC)	O	2.285	ab
TriggerAddressList	O	2.286	y
UserGroup	O	2.293	u
VoiceMailboxNumber	O	2.295	p
VoiceMailboxPIN	O	2.296	q

Notes:

a. Required to identify originating call.

b. Include to specify special alerting treatment.

c. Include if related feature is active.

d. Optionally include if TerminationTreatment parameter value is *Dialogue*, to select a dialogue or to provide information to a dialogue.

e. Optionally include if TerminationTreatment parameter value is *VoiceMailRetrieval* or *VoiceMailStorage* to select the voice mail system.

f. Include if available and if TerminationTreatment parameter value is *MS termination*.

g. Include if TerminationTreatment parameter value is *MS termination* and this is a multileg call (e.g., an FA call).

h. May be included from VLR to MSC-V. Usage is not defined from HLR to VLR.

i.   Include to identify Originating MSC.

j.   Include to inform the serving system of the recommended no-answer time-out.

k.   Include if modification to normal feature processing is required for call in progress.

l.   Include if available (e.g., from received parameter or lower layers) for subsequent call redirection.

m.   Include on a multi-leg call.

n.   May be included to identify the functional entity sending the message.

o.   Include to differentiate termination types, defaulting to value *MS termination*.

p.   Include if the TerminationTreatment parameter value is *VoiceMailRetrieval* or *VoiceMailStorage* and the mailbox is not the MobileIdentificationNumber.

q.   Optional, if the TerminationTreatment parameter value is *VoiceMailRetrieval* or *VoiceMailStorage*.

r.   When this message is used in accessing a feature at an adjunct MSC (e.g., for voice message retrieval), the HLR includes the type of MSID appropriate to the MS and the feature being accessed. Otherwise the HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System and it includes the MobileIdentificationNumber type of MSID when the IMSI was not present in the last message received from the Serving System. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received from the HLR.

s.   Include if the MS is Digital Channel Control capable to indicate which control channel mode shall be use to page the MS.

t.   Required unless UserGroup parameter is included.

u.   Include for user group alerting. If this parameter is included do not include MobileIdentificationNumber.

v.   Include to identify requested CDMA service information.

w.   Include to identify requested TDMA service information.

x.   Include if available when a Calling Party Number String parameter has been included.

y.   Include if the WIN trigger address list information is to be modified for this call.

z.   Include if available when a RedirectingNumberString parameter has been included.

aa.   The digits form of this information is included for service logic invocations from the Serving MSC. The string form of this information is included for presentation to the MS.

ab.   Include to inform the serving system of the Originating MSC capabilities.

ac.   Include only one of these mutually exclusive parameters.

ad.   Include if termination triggers are to be modified for this call.

The RoutingRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

RoutingRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
MSCID (Serving)		M	2.151	
AccessDeniedReason		O	2.1	a
BillingID (Anchor)		O	2.23	b
CDMAServiceOption		O	2.66	g
ConditionallyDeniedReason		O	2.83	c
Digits (Destination)		O	2.105	d
MSCIdentificationNumber		O	2.152	e
PC_SSN (Serving MSC)		O	2.176	f
TDMAServiceCode		O	2.273	h

Notes:

a. Include if access may be denied.

b. Include for recording purposes (see *DMH)*.

c. Include if Call Waiting is possible.

d. Include to carry a Temporary Local Directory Number (TLDN).

e. Include to identify the Serving MSC.

f. Include for possible screening by the Originating MSC for call redirection attempts on this leg.

g. Include to identify the accepted CDMA service information.

h. Include to identify the accepted TDMA service information.

2.59 Search

The Search (SEARCH) operation is used by a Service Control Function (SCF) to request data items stored in a remote Service Data Function (SDF).

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	SCP or SN	SCP or SN
Case 2	SCP or SN	HLR
Case 3	HLR	SCP or SN

The Search operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Search INVOKE Parameters				Timer: ST
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
DatabaseKey		M	2.91	a
ServiceDataAccessElementList		M	2.217	b

Notes:

a. The parameter value is determined by bi-lateral negotiation between sender and receiver to be interpreted as a database key. For example, possible values might be MDN, MIN or a proprietary database key.

b. For this use of the ServiceDataAccessElementList parameter, the optional Change and DataValue parameters are not included in any of the individual DataAccessElements in the DataAccessElementList component of any of the ServiceDataAccessElements. For this use, only the mandatory DataID parameter is included in those DataAccessElements.

The Search operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Search RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ServiceDataAccessElementList		M	2.217	a

Notes:

a. For this use of the ServiceDataAccessElementList parameter, the optional Change parameter is not included in any of the individual DataAccessElements in the DataAccessElementList component of any ServiceDataAccessElement. For this use, the optional DataValue parameter may be present in any of those DataAccessElements.

2.60 SeizeResource

The SeizeResource (SEIZERES) operation is used by the SCF to request an SRF resource required by the SCF for service logic execution.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	IP or SN
Case 2	SCP	IP or SN
Case 3	SN	IP or SN

The SeizeResource operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SeizeResource INVOKE Parameters				Timer: SZRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
PreferredLanguageIndicator		O	2.179	
PrivateSpecializedResource		O	2.181	a
SpecializedResource		O	2.250	a

Notes:

    a.   At least one of these parameters must be included.

The SeizeResource operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

SeizeResource RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
DestinationDigits		M	2.103	a

Notes:

    a.   Specialized resource address.

2.61 ServiceRequest

The ServiceRequest (SERVREQ) operation is used by service logic to invoke specific service logic execution on another functional entity (FE) containing the service logic for the requested services.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	SCP or SN
Case 2	SCP or SN	SCP or SN
Case 3	SCP or SN	HLR

The ServiceRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

ServiceRequest INVOKE Parameters				Timer: SVRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ServiceID		M	2.220	
AccessDeniedReason		O	2.1	c, d
AvailabilityType		O	2.20	c, e
BillingID		O	2.23	a, f
CallingPartyName		O	2.29	a
CallingPartyNumberDigits1		O	2.30	a
CallingPartyNumberDigits2		O	2.31	b
CallingPartySubaddress		O	2.34	a
ConditionallyDeniedReason		O	2.83	c, d
DataAccessElementList		O	2.90	c
Digits (Dialed)		O	2.105	a
GroupInformation		O	2.124	c
IMSI		O	2.127	p
LegInformation		O	2.133	c
LocationAreaID		O	2.135	c
MobileDirectoryNumber		O	2.139	c, g
MobileIdentificaitonNumber		O	2.140	p
MSCID (Invoking)		O	2.151	c, h
MSCIdentificationNumber (Invoking)		O	2.152	c, i
PC_SSN		O	2.176	i, j
PilotBillingID		O	2.177	c

PilotNumber	O	2.178	c
PreferredLanguageIndicator	O	2.179	a
RedirectingPartyName	O	2.200	a
RedirectingNumberDigits	O	2.198	a
RedirectingSubaddress	O	2.201	a
RedirectionReason	O	2.202	a, c
SenderIdentificationNumber	O	2.215	k
ServingCellID	O	2.225	c
SystemMyTypeCode	O	2.260	l
TerminationAccessType	O	2.279	c
TimeDateOffset	O	2.284	c
TransactionCapability	O	2.285	m
TriggerType	O	2.289	n
WINCapability	O	2.299	o

Notes:

    a.   Include if available.

    b.   Include if user provided, passed screening calling party number is available.

    c.   Include if applicable.

    d.   Include if a RoutingRequest operation was completed prior to the ServiceRequest operation, and access was denied.

    e.   Include when MS is predictably unavailable for Call Delivery (e.g., slotted mode or sleep mode).

    f.   Include to correlate service usage with call instance.

    g.   Include if available for recording purposes (see *DMH*)

    h.   Include to identify invoking MSC.

    i.   Include if SS7 is used.

    j.   Not for international applications.

    k.   Include to identify invoking FE.

    l.   Include to indicate the vendor type of the invoking FE.

    m.   Include to indicate the capabilities of the MSC that the invoking FE (e.g., HLR, SCP, SN) chooses to convey to the NE (e.g., SCP, SN) with the service logic for the requested services.

    n.   Include to identify the trigger encountered by the MSC.

    o.   Include to indicate the WIN capabilities supported.

    p.   Include as the service key, if applicable

The ServiceRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

ServiceRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	c
ActionCode		O	2.2	d
AlertCode		O	2.4	e
AnnouncementList		O	2.10	f
CallingPartyName		O	2.29	a
CallingPartyNumberString1		O	2.32	a
CallingPartyNumberString2		O	2.33	a
CallingPartySubaddress		O	2.34	a
CarrierDigits		O	2.37	a
Digits (Dialed)		O	2.105	g
DisplayText		O	2.106	a, b
DisplayText2		O	2.107	a, b
DMH_AccountCodeDigits		O	2.108	a
DMH_AlternateBillingDigits		O	2.109	a
DMH_BillingDigits		O	2.110	a
DMH_RedirectionIndicator		O	2.111	a
GroupInformation		O	2.124	a
MobileDirectoryNumber		O	2.139	a
NoAnswerTime		O	2.165	a
RedirectingNumberDigits		O	2.198	a
RedirectingNumberString		O	2.199	a
RedirectingPartyName		O	2.200	a
RedirectingSubaddress		O	2.201	a
RoutingDigits		O	2.209	a
TerminationList		O	2.280	h

Notes:

a.   Include if applicable.

b.   Include only one of these mutually exclusive parameters

c.   Include if service logic determines access to the MS is denied.

d.   Include if action to be performed is not implied through presence of other parameters.

e.   Include to specify special alerting treatment.

f.   Include if one or more tones or announcements are to be applied to the MS.

g.   Include if digits remain to be translated by the MSC.

h.   Include if call routing is required.

2.62 SMSDeliveryBackward

The SMSDeliveryBackward (SMDBACK) operation is a general purpose operation that is used to convey an MS-originated short message or in general any other information or encapsulated data to the Anchor MSC after handoff.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Serving MSC	Anchor MSC
Case 2	Serving MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Anchor MSC

The SMSDeliveryBackward operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSDeliveryBackward INVOKE Parameters			Timer: SBT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
MSID		M	2.153	h
SMS_BearerData		M	2.233	
SMS_TeleserviceIdentifier		M	2.246	
ElectronicSerialNumber		O	2.112	a
SMS_ChargeIndicator		O	2.235	b
SMS_DestinationAddress		O	2.236	c
SMS_OriginalDestinationAddress		O	2.240	d
SMS_OriginalDestinationSubaddress		O	2.241	a
SMS_OriginalOriginatingAddress		O	2.242	e
SMS_OriginalOriginatingSubaddress		O	2.243	a
SMS_TransactionID		O	2.248	g

Notes:

a. Include if applicable.

b. Include if applicable. If not received, charge message originator.

c. Include if an MC address is specified by the originating SME.

d. Include to identify the SME to which the short message is destined (e.g., the MDN, for termination to an MS-based SME).

e. Include to identify the SME from which the short message originated (e.g., the MDN, if originated by an MS-based SME).

f. Intentionally left for future modifications.

g. Include if TDMA to identify an MS based SMS originating SME.

h. Include the identifier with which the MS last accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

The SMSDeliveryBackward operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSDeliveryBackward RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b
SMS_TransactionID		O	2.248	c

Notes:

a. Include for positive acknowledgments, when applicable.

b. Include for all negative acknowledgments.

c. Include if TDMA to identify an MS based SMS originating SME.

2.63　SMSDeliveryForward

The SMSDeliveryForward (SMDFWD) operation is a general purpose operation that is used to convey an MS-terminated short message or in general any other information or encapsulated data to the Serving MSC after handoff.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Serving MSC
Case 2	Anchor MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Serving MSC

The SMSDeliveryForward operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSDeliveryForward INVOKE Parameters				Timer: SFT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
SMS_BearerData		M	2.233	
SMS_TeleserviceIdentifier		M	2.246	
ElectronicSerialNumber		O	2.112	b
IMSI		O	2.127	h
MobileIdentificationNumber		O	2.140	a, h
SMS_ChargeIndicator		O	2.235	c
SMS_OriginalDestinationAddress		O	2.240	e
SMS_OriginalDestinationSubaddress		O	2.241	b
SMS_OriginalOriginatingAddress		O	2.242	f
SMS_OriginalOriginatingSubaddress		O	2.243	b
SMS_OriginatingAddress		O	2.244	g

Notes:

a.　Include to identify the destination MS.

b.　Include if applicable.

c.　Include if applicable. If not received, charge message originator.

d.　Intentionally left for future modifications.

e.　Include to identify the SME to which the short message is destined (e.g., the MDN, for termination to the MS-based SME).

f. Include to identify the SME from which the short message originated (e.g., the MDN, if originated by an MS-based SME).

g. Include if the MC address may be sent to the MS.

h. Include if available. At least one of these parameters should be present.

The SMSDeliveryForward operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSDeliveryForward RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b

Notes:

a. Include for positive acknowledgments, when applicable.

b. Include for all negative acknowledgments.

2.64 SMSDeliveryPointToPoint

The SMSDeliveryPointToPoint (SMDPP) operation is a general purpose operation that is used to convey a short message or in general any other information or encapsulated data from one point to another point and report on the success of failure of that transfer (for example, as used in SMS and OTASP).

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	SME	MC
Case 2	MC	MC
Case 3	MC	SME
Case 4	SME	SME
Case 5 (Note 1)	SME	OTAF
Case 6 (Note 1)	OTAF	SME
Case 7 (Note 2)	OTAF	MSC

Notes:

1. Cases 5 and 6 are only applicable to TDMA OTA.
2. Case 7 is only applicable to CDMA OTA.

2.64.1 SMSDeiveryPointToPoint Parameter Sets: PointToPont Variant

The SMSDeliveryPointToPoint operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSDeliveryPointToPoint INVOKE Parameters				Timer: SMT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
SMS_BearerData		M	2.233		
SMS_TeleserviceIdentifier		M	2.246		
ActionCode		O	2.2	j	
ElectronicSerialNumber		O	2.112	a	
InterMessageTime		O	2.128	o	
MSID		O	2.153	a, i, m	
NewlyAssignedMIN		O	2.161	k	
NewlyAssignedIMSI		O	2.160	k	

NewMINExtension	O	2.163	l
ServiceIndicator	O	2.221	p
SMS_ChargeIndicator	O	2.235	b
SMS_DestinationAddress	O	2.236	c
SMS_MessageCount	O	2.237	d
SMS_NotificationIndicator	O	2.239	e
SMS_OriginalDestinationAddress	O	2.240	f
SMS_OriginalDestinationSubaddress	O	2.241	g
SMS_OriginalOriginatingAddress	O	2.242	h
SMS_OriginalOriginatingSubaddress	O	2.243	g
SMS_OriginatingAddress	O	2.244	c
TemporaryReferenceNumber	O	2.277	n

Notes:

a. Include if known on MS-to-MC deliveries to identify the originating MS-based SME. Include if known on MC-to-MS deliveries to identify the destination MS-based SME. Include if known if the operation is used for CDMA OTASP or CDMA OTAPA.

b. Include if applicable. If not received, charge the message originator.

c. May be included if not carried by the underlying data transport. May require an interconnection agreement to facilitate interworking between network types.

d. Include if applicable. If not received, assume value 0.

e. Include if no notification is necessary. If not received, assume notification is requested.

f. Include to identify the SME to which the short message is destined (e.g., the MDN, for termination to an MS-based SME).

g. Include if applicable.

h. Include to identify the SME from which the short message originated (e.g., the MDN, if originated by an MS-based SME).

i. When this message is sent from an MC to the Anchor or Serving MSC for an MS-based SME, the MC includes the MSID set to MIN, if available; otherwise the MSID is set to IMSI.

j. Include for CDMA OTASP or CDMA OTAPA if action to be performed is not implied through presence of other parameters.

k. Include for CDMA OTASP or CDMA OTAPA in requests to initiate MSC procedures[1] if a value has been assigned for the MS during the current OTASP or OTAPA session.

l. Include for CDMA OTASP or CDMA OTAPA in requests to initiate MSC procedures[1] if a new IMSI_M has been assigned for the MS during the current OTASP or OTAPA session.

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[1] The MSC procedures are "Registration Following Successful OTA" and "Notification of Newly Assigned MIN (or IMSI_M) or IMSI or Both Following Successful OTASP or OTAPA".

m. For CDMA OTASP, contains the Activation_MIN. For CDMA OTAPA, contains the MS's MSID at the start of the OTAPA session. If the MS has both a MIN and an IMSI at the start of the OTAPA session then the MIN form of the MSID is used.

n. Include for CDMA OTASP when requesting MSC attachment to the OTAF to provide a correlation between the OTASP voice and data connections.

o. Include if applicable for CDMA OTAPA when the ActionCode value is *Allocate Resource* and inter-message timing should be different from the system default.

p. Include for CDMA OTASP or CDMA OTAPA.

The SMSDeliveryPointToPoint operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSDeliveryPointToPoint RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AuthorizationDenied		O	2.18	h
DenyAccess		O	2.100	c
ElectronicSerialNumber		O	2.112	d
MobileStationMSID		O	2.143	e
MSCID		O	2.151	f
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b
SystemCapabilities		O	2.259	g

Notes:

a. Include for positive or negative acknowledgments, when applicable.

b. Include for all negative acknowledgments.

c. Include for CDMA OTASP in the response to an attachment request if the AC has denied service to this MS.

d. Include in response to an attachment request, for CDMA OTASP.

e. Include for CDMA OTASP in the response to an attachment request to indicate the MIN or IMSI value currently in the MS's permanent memory.

f. Include for CDMA OTASP in the response to an attachment request to identify the Serving System.

g. Include for CDMA OTASP in the response to an attachment request to identify the serving system's authentication capabilities.

h. Include for CDMA OTASP in the response to an attachment request if the HLR had previously denied authorization to this MS or the registration attempt was unsuccessful.

2.64.2 SMSDeiveryPointToPoint Parameter Sets: Broadcast Variant

The SMSDeliveryPointToPoint operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSDeliveryPointToPoint INVOKE Parameters				Timer: SMT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
SMS_BearerData		M	2.233	
SMS_TeleserviceIdentifier		M	2.246	
BroadcastCategory		O	2.303	a
BroadcastCategorySpecificInformation		O	2.304	b
BroadcastMessageIdentifier		O	2.305	c
BroadcastMessageStatus		O	2.306	d
BroadcastMessageStatus		O	2.307	e
BroadcastPeriodicity		O	2.308	f
BroadcastServiceGroup		O	2.309	b
BroadcastZoneIdentifier		O	2.310	g, l
BroadcastZoneIdentifierList		O	2.311	h, l
PreferredLanguageIndicator		O	2.179	i
SMS_DestinationAddress		O	2.236	j
SMS_OriginalOriginatingAddress		O	2.242	k
SMS_OriginalOriginatingSubaddress		O	2.243	b
SMS_OriginatingAddress		O	2.244	j

Notes:

a. Include to indicate the SMDPP is being used for broadcast and to specify the category of information being sent in the broadcast message. If the BroadcastCategory parameter is present, but the BroadcastMessageIdentifier parameter is not, all messages from the particular SME of the indicated category are identified.

b. Include if applicable.

c. Include to uniquely identify the broadcast message over the network originating from a particular SME (i.e., unique on a per-SME basis). If the BroadcastMessageIdentifier is not present, all messages from the particular SME of the indicated category are identified.

d. Include to indicate the priority of a broadcast message. If absent, treat as "normal" priority.

e. Include to indicate the status of a broadcast message. If absent, treat as "new" message.

f. Include if applicable to indicate periodicity of broadcast.

g. May be included to indicate the domain over which the broadcast is to be made or canceled.

h. May be included to indicate the list of domains of various types over which the broadcast is to be made or canceled.

i. Include to indicate the language used for the SMS Bearer Data in the broadcast. Required for CDMA. For CDMA, the MC re-encodes the PreferredLanguageIndicator from the value specified in Part 550, Section 2.180 for the language in use to the value specified in *TSB58*.

j. May be included if not carried by the underlying data transport. May require an interconnection agreement to facilitate interworking between network types.

k. Include if not the same as the originating address (SMS_OriginatingAddress; or the underlying data transport originating address).

l. These parameters are mutually exclusive. If both parameters are absent from a BTTC message received by an MC, the broadcast or cancellation will be across all MSCs in the broadcast domain of the MC. If both parameters are absent from a BTTC message received by an MSC, the broadcast or cancellation will be across the whole MSC.

The SMSDeliveryPointToPoint operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSDeliveryPointToPoint RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b

Notes:

a. Include for positive or negative acknowledgments, when applicable.

b. Include for all negative acknowledgments.

2.65 SMSDeliveryPointToPointAck

The SMSDeliveryPointToPointAck (SMDPPACK) operation is used to convey a Short Message acknowledgement to an MS-originated short message or in general any other information or encapsulated data when an MS has handed off after initiating an SMS origination.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Anchor MSC	Serving MSC
Case 2	Anchor MSC	Tandem MSC
Case 3	Tandem MSC	Tandem MSC
Case 4	Tandem MSC	Serving MSC

The SMSDeliveryPointToPointAck operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP UNIDIRECTIONAL package.

SMSDeliveryPointToPointAck INVOKE Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
IMSI		O	2.127	d
MobileIdentificationNumber		O	2.140	d
SMS_BearerData		O	2.233	a
SMS_CauseCode		O	2.234	b
SMS_TransactionID		O	2.248	c

Notes:

a.   Include for positive acknowledgements, when applicable.

b.   Include for all negative acknowledgements.

c.   For TDMA, include to identify the SMS origination initiated by an MS that has been handed off after it initiated an SMS origination.

d.   Include if available. At least one of these parameters should be present.

2.66   SMSNotification

The SMSNotification (SMSNOT) operation is used to report a change in an MS's ability to receive teleservice messages based on the location or status of the MS. This message, at a minimum, is used to report the accessibility of an MS following a postponed SMSRequest or SMSDeliveryPointToPoint. This message may also be used to revoke delivery permission previously granted with either an SMSRequest or an SMSNotification.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	MC
Case 2	MSC	MC
Case 3 (Note 1)	HLR	OTAF
Case 4 (Note 2)	MSC	OTAF

Notes:

1.   Case 3 is applicable to both CDMA and TDMA OTA.

2.   Case 4 is only applicable to TDMA OTA.

The SMSNotification operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSNotification INVOKE Parameters				Timer: SNT	
Field	**Value**	**Type**	**Reference**		**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
ElectronicSerialNumber		M	2.112		
MSID		M	2.153		c
MobileDirectoryNumber		O	2.139		f
SMS_AccessDeniedReason		O	2.231		a
SMS_Address		O	2.232		a, b
SMS_TeleserviceIdentifier		O	2.246		e
TransactionCapability (Serving MSC)		O	2.285		d

Notes:

a.   These parameters are mutually exclusive; however, one must be present.

b.   Included to indicate the temporary routing address of an MS-based SME.

c.   Include the MIN form of the MSID if the MS has a MIN; otherwise include the IMSI form of the MSID.

d. Include if routing of SMS messages to the specified MS is allowed and if any applicable capabilities (e.g., SCCP-based segmentation and reassembly) are set.

e. Include for TDMA if the notification is issued by the HLR independent of a postponed (previous) SMSRequest to initiate a SMS teleservice on an MS.

f. Include if applicable.

The SMSNotification operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSNotification RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
SMS_MessageCount		O	2.237	a

Notes:

a. Set to value zero if the MC does not have SMS message delivery pending for the MS identified.

2.67 SMSRequest

The SMSRequest (SMSREQ) operation is used to request an MS's current SMS routing address with a default to request notification when the MS becomes available if the MS is not currently available.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MC	HLR
Case 2	HLR	Serving VLR
Case 3	Serving VLR	Serving MSC
Case 4 (Note 1)	OTAF	HLR

Notes:

1. Case 4 is applicable to both CDMA and TDMA OTA.

The SMSRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

SMSRequest INVOKE Parameters				Timer: SRT	
Field	**Value**	**Type**	**Reference**	**Notes**	
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1		
Length	variable octets	M	520-1.3.2.1		
Contents					
MSID		O	2.153	e, f, g	
ElectronicSerialNumber		O	2.112	a	
MobileDirectoryNumber		O	2.139	e	
ServiceIndicator		O	2.221	d	
SMS_NotificationIndicator		O	2.239	b	
SMS_TeleserviceIdentifier		O	2.246	c	

Notes:

a. Include if known.

b. Include to specify notification requirements. If not included, implies notification shall be sent when MS becomes available (default).

c. Include to identify the teleservice for which the request is being made.

d. Include to identify CDMA OTAPA service.

e. At least one parameter must be present (i.e. either MSID or MobileDirectoryNumber) when this message is sent from the MC to the HLR.

f. The HLR includes the IMSI type of MSID if the IMSI was present in the last message received from the Serving System; otherwise the HLR includes the MobileIdentificationNumber type of MSID. The VLR includes the type of MSID last received from the Serving MSC; this may not be the type of MSID received form the HLR

g. This parameter is mandatory when the message is sent from the HLR to the VLR or from the VLR to the MSC.

The SMSRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

SMSRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
ElectronicSerialNumber		O	2.112	a
MSID		O	2.153	e
SMS_AccessDeniedReason		O	2.231	b, c
SMS_Address		O	2.232	c, d
SMS_CauseCode		O	2.234	g
TransactionCapability (Serving MSC)		O	2.285	f

Notes:

a. Include if not received in SMSRequest INVOKE and SMS delivery is allowed.

b. Include if delivery of SMS messages is denied or deferred.

c. These parameters are mutually exclusive.

d. Include if routing of SMS messages is applicable.

e. Include the mobile station identifier that should be used for SMS delivery. This parameter is only included by the HLR. The MSID should be the MIN type if available, otherwise the MSID should be an IMSI.

f. Include if routing of SMS messages to the specified MS is allowed and if any applicable capabilities (e.g., SCCP-based segmentation and reassembly) are set.

g. Include for TDMA, to specify the failure cause for this request (e.g. if a request is sent to an HLR or MSC that does not support the specified teleservice).

2.68   SRFDirective

The SRFDirective (SRFDIR) operation is used by service control logic to direct the operation of an IP (or other network entity) which provides user interaction.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	IP
Case 2	SCP	IP
Case 3	SN	IP

The SRFDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP CONVERSATION WITHOUT PERMISSION package. The Parameter Set is encoded as follows:

SRFDirective INVOKE Parameters				Timer: SRFDT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
AnnouncementList		O	2.10	a, d
DigitCollectionControl		O	2.104	b
ExecuteScript		O	2.115	c, d

Notes:

a.   When the AnnouncementList parameter is present, the ExecuteScript parameter shall not be included.

b.   This parameter may only be included if the AnnouncementList parameter is present.

c.   When the ExecuteScript parameter is present, the AnnouncementList and DigitCollectionControl parameters shall not be included.

d.   At least one of these parameters must be present.

The SRFDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP CONVERSATION WITH PERMISSION package. The Parameter Set is encoded as follows:

SRFDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
Digits (Dialed)		O	2.105	a, b
ScriptResult		O	2.212	c

Notes:

a. This may only be included when the AnnouncementList parameter is present in the SRFDIR.

b. The number of digits returned may be zero, indicating either implying the user did not enter digits before time-out or that all announcements were played.

c. This may only be included when the ExecuteScript parameter is included in the SRFDIR.

2.69   TBusy

The TBusy (TBUSY) operation is used by an MSC to obtain call treatment instructions from an SCP or SN for the called party.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	SCP
Case 2	MSC	SN

The TBusy operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TBusy INVOKE Parameters			Timer: TBT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Invoking)		M	2.23	a
MSCID		M	2.151	b
TransactionCapability		M	2.285	
TriggerType		M	2.289	c
WINCapability		M	2.299	d
CallingPartyName		O	2.29	e
CallingPartyNumberDigits1		O	2.30	e
CallingPartyNumberDigits2		O	2.31	e
CallingPartySubaddress		O	2.34	e
CDMAServiceOption		O	2.66	k
ElectronicSerialNumber		O	2.112	f
GroupInformation		O	2.124	f
IMSI		O	2.127	f, h
LegInformation		O	2.133	f
LocationAreaID		O	2.135	g
MobileDirectoryNumber		O	2.139	h, i
MobileIdentificationNumber		O	2.140	f, h
MSCIdentificationNumber		O	2.152	b
OneTimeFeatureIndicator		O	2.167	j
PilotBillingID		O	2.177	f
PilotNumber		O	2.178	f
PreferredLanguageIndicator		O	2.179	g

RedirectingNumberDigits	O	2.198	e
RedirectingSubaddress	O	2.201	e
RedirectionReason	O	2.202	f
ServingCellID	O	2.225	g
SystemMyTypeCode	O	2.260	
TDMAServiceCode	O	2.273	l
TerminationAccessType	O	2.279	f

Notes:

a.   Include to identify the call at the invoking MSC

b.   Include to identify the invoking MSC.

c.   Include to identify the trigger encountered.

d.   Include to identify the WIN capabilities supported.

e.   Include if available (i.e., provided in call origination).

f.   Include if available.

g.   Include if available. (Note: this information element may not be available when this operation is initiated by a non-Serving MSC.)

h.   One must be present for use as a service key.

i.   Include if available for recording purposes (see *DMH)*.

j.   Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

k.   Include if CDMAServiceOption is known to allow distinctive forwarding based on Service Type.

l.   Include if TDMAServiceCode is known to allow distinctive forwarding based on Service Type.

The operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TBusy RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AnnouncementList		O	2.10	c
CallingPartyNumberString1		O	2.32	d, e
CallingPartyNumberString2		O	2.33	d, e
CarrierDigits		O	2.37	
DisplayText		O	2.106	d, e, m
DisplayText2		O	2.107	d, e, m
DMH_AccountCodeDigits		O	2.108	f
DMH_AlternateBillingDigits		O	2.109	f
DMH_BillingDigits		O	2.110	f
DMH_RedirectionIndicator		O	2.111	f
GroupInformation		O	2.124	g
OneTimeFeatureIndicator		O	2.167	h
PilotNumber		O	2.178	g
RedirectingNumberDigits		O	2.198	i
RedirectingNumberString		O	2.199	d, e
RedirectingSubaddress		O	2.201	i
RoutingDigits		O	2.209	
TerminationList		O	2.280	k
TerminationTriggers		O	2.283	l
TriggerAddressList		O	2.286	l

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if one or more tones or announcements are to be applied to the MS.

d. Include if a LocalTermination parameter is included in the TerminationList parameter.

e. Include if the related feature is active.

f. Include if available for recording purposes (see *DMH*).

g. Include for multi-leg calls.

h. Include if modification to normal feature processing is required for the call in progress.

i. Include if call is being redirected.

j. Intentionally left for future modifications.

k. Include if call routing is required.

l. Include if applicable.

m. Include only one of these mutually exclusive parameters.

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2.70 TMSIDirective

The TMSIDirective (TMSIDIR) operation is used to assign the MS's full TMSI or TMSI Code within a TMSI Zone. The INVOKE comes from the serving system (e.g., VLR).

The following table lists the valid combinations of invoking and responding FEs:

	INVOKING FE	RESPONDING FE
Case 1	Serving VLR	Serving MSC

One of two possible results is returned:

1. The TMSIDirective operation is successful.
2. Notification that TMSIDirective is unsuccessful with an appropriate denied reason.

The TMSIDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TMSIDirective INVOKE Parameters			Timer: TDT	
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	
NetworkTMSIExpirationTime		M	2.159	
NewNetworkTMSI		M	2.164	
LocationAreaID		O	2.135	a
NetworkTMSI		O	2.158	a

Notes:

a. Include if known.

The TMSIDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TMSI Directive RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
DenyAccess		O	2.100	b
ElectronicSerialNumber		O	2.112	b
MSID		O	2.153	b
ReasonList		O	2.195	a

Notes:

    a.   Include if no response from the MS.

    b.   Include if MS fails authentication.

2.71   TNoAnswer

The TNoAnswer (TNOANS) operation is used by an MSC to obtain call treatment instructions from an SCP or SN for the called party.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	SCP
Case 2	MSC	SN

The TNoAnswer operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TNoAnswer INVOKE Parameters				Timer: TNAT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Invoking)		M	2.23	a
MSCID		M	2.151	b
TransactionCapability		M	2.285	
TriggerType		M	2.289	c
WINCapability		M	2.299	d
CallingPartyName		O	2.29	e
CallingPartyNumberDigits1		O	2.30	e
CallingPartyNumberDigits2		O	2.31	e
CallingPartySubaddress		O	2.34	e
CDMAServiceOption		O	2.66	k
ElectronicSerialNumber		O	2.112	f
GroupInformation		O	2.124	f
IMSI		O	2.127	f, h
LegInformation		O	2.133	f
LocationAreaID		O	2.135	g
MobileDirectoryNumber		O	2.139	h, i
MobileIdentificationNumber		O	2.140	f, h
OneTimeFeatureIndicator		O	2.167	j
PilotBillingID		O	2.177	f
PilotNumber		O	2.178	f
PreferredLanguageIndicator		O	2.179	g
RedirectingNumberDigits		O	2.198	e

RedirectingSubaddress	O	2.201	e
RedirectionReason	O	2.202	f
ServingCellID	O	2.225	g
SystemMyTypeCode	O	2.260	
TDMAServiceCode	O	2.273	l
TerminationAccessType	O	2.279	f

Notes:

a. Include to identify the call at the invoking MSC

b. Include to identify the invoking MSC.

c. Include to identify the trigger encountered.

d. Include to identify the WIN capabilities supported.

e. Include if available (i.e., provided in call origination).

f. Include if available.

g. Include if available. (Note: this information element may not be available when this operation is initiated by a non-Serving MSC.)

h. One must be present for use as a service key.

i. Include if available for recording purposes (see *DMH)*.

j. Include if any OneTimeFeatureIndicator status bits are set (i.e., have value of *1*).

k. Include if CDMAServiceOption is known to allow distinctive forwarding based on Service Type.

l. Include if TDMAServiceCode is known to allow distinctive forwarding based on Service Type.

The TNoAnswer operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TNoAnswer RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	a
ActionCode		O	2.2	b
AnnouncementList		O	2.10	c
CallingPartyNumberString1		O	2.32	d, e
CallingPartyNumberString2		O	2.33	d, e
CarrierDigits		O	2.37	
DisplayText		O	2.106	d, e, m
DisplayText2		O	2.107	d, e, m
DMH_AccountCodeDigits		O	2.108	f
DMH_AlternateBillingDigits		O	2.109	f
DMH_BillingDigits		O	2.110	f
DMH_RedirectionIndicator		O	2.111	f
GroupInformation		O	2.124	g
OneTimeFeatureIndicator		O	2.167	h
PilotNumber		O	2.178	g
RedirectingNumberDigits		O	2.198	i
RedirectingNumberString		O	2.199	d, e
RedirectingSubaddress		O	2.201	i
RoutingDigits		O	2.209	
TerminationList		O	2.280	k
TerminationTriggers		O	2.283	l
TriggerAddressList		O	2.286	l

Notes:

a. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList parameter).

b. Include if action to be performed is not implied through presence of other parameters.

c. Include if one or more tones or announcements are to be applied to the MS.

d. Include if a LocalTermination parameter is included in the TerminationList parameter.

e. Include if the related feature is active.

f.   Include if available for recording purposes (see *DMH*).

g.   Include for multi-leg calls.

h.   Include if modification to normal feature processing is required for the call in progress.

i.   Include if call is being redirected.

j.   Intentionally left for future modifications.

k.   Include if call routing is required.

l.   Include if applicable.

m.   Include only one of these mutually exclusive parameters.

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2.72 TransferToNumberRequest

The TransferToNumberRequest (TRANUMREQ) operation is used during feature processing to obtain an MS's forward-to number from the HLR.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Originating MSC	HLR
Case 2	Serving MSC	HLR
Case 3	HLR	SCP

The TransferToNumberRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TransferToNumberRequest INVOKE Parameters				Timer: TTNRT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
ElectronicSerialNumber		M	2.112	
MSID		M	2.151	f
RedirectionReason		M	2.202	
SystemMyTypeCode (MSC)		M	2.260	
BillingID (Originating)		O	2.23	a
CallingPartyName		O	2.29	k
CallingPartyNumberDigits1		O	2.30	k
CallingPartyNumberDigits2		O	2.31	k
CallingPartySubaddress		O	2.34	k
CDMAServiceOption		O	2.66	h
GroupInformation		O	2.124	b
LegInformation		O	2.133	c
MobileIdentificationNumber		O	2.140	n
MSCID (Originating)		O	2.151	d
MSCIdentificationNumber		O	2.152	l
PilotBillingID		O	2.177	m
PilotNumber		O	2.178	m
RedirectingNumberDigits		O	2.198	g
RedirectingSubaddress		O	2.201	g
SenderIdentificationNumber		O	2.215	j

| TDMAServiceCode | O | 2.273 | i |
| TransactionCapability | O | 2.285 | e |

Notes:

a. Include to identify the Originating MSC and its BillingID for subsequent call redirection.

b. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for the *None Reachable* termination trigger.

c. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for any termination trigger except *None Reachable*.

d. Included on *TIA-41-D* or later.

e. Include on *IS-41-C* or later.

f. Use the MobileIdentificationNumber form of the MSID if the IMSI is known to be a MIN-based IMSI.

g. Include if available (i.e., provided in call origination) for the *None Reachable* termination trigger.

h. Include if CDMA channel is in use to allow distinctive forwarding based on Service Type.

i. Include if TDMA channel is in use to allow distinctive forwarding based on Service Type.

j. May be included to identify the network entity sending the message.

k. Include if available (i.e., provided in call origination).

l. Include to identify the initiating MSC and to indicate that the MSC is capable of accepting digits in the international format.

m. Include if available.

n. Include if known and if the IMSI has been included as MSID.

The TransferToNumberRequest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TransferToNumberRequest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
Digits (Destination)		M	2.105	a
AccessDeniedReason		O	2.1	b
ActionCode		O	2.2	c
AnnouncementList		O	2.10	d
CallingPartyNumberString1		O	2.32	e
CallingPartyNumberString2		O	2.33	e
CallingPartySubaddress		O	2.34	e, f
Digits (Carrier)		O	2.105	g
DisplayText		O	2.106	e, k
DisplayText2		O	2.107	e, k
DMH_AccountCodeDigits		O	2.108	h
DMH_AlternateBillingDigits		O	2.109	h
DMH_BillingDigits		O	2.110	h
DMH_RedirectionIndicator		O	2.111	h
GroupInformation		O	2.124	i
MobileDirectoryNumber		O	2.139	h
NoAnswerTime		O	2.165	g
RedirectingNumberDigits		O	2.198	f
RedirectingNumberString		O	2.199	e
RedirectingSubaddress		O	2.201	e, f
TerminationList		O	2.280	j
TerminationTriggers		O	2.283	g

Notes:

a. Encode the Digits (Destination) as *International* if it is known that the requesting MSC can accept the digits in this format (e.g., the MSCIdentificationNumber parameter was received in the INVOKE) and an HLR stored number is being provided.
This parameter is ignored if the TeminationList parameter is provided.

b. Include if access is denied. If included, no other optional parameters shall be included (with the exception of the AnnouncementList or ActionCode).

c. Include if action to be performed is not implied through presence of other parameters.

d. Include if one or more tones or announcements are to be applied to the MS.

e.   Include if related feature is active and if a LocalTermination parameter is included within the TerminationList parameter.

f.   Optionally include if a PSTNTermination parameter or an IntersystemTermination parameter is included within the TerminationList parameter.

g.   Include if applicable.

h.   Include if available for recording purposes (see *DMH*).

i.   Include for multi-leg calls.

j.   Include if call routing is required.

k.   Include only one of these mutually exclusive parameters.

2.73 TrunkTest

The TrunkTest (TTEST) operation is used by an MSC to request that the designated trunk be placed in a test configuration (e.g., loop-back) at a remote MSC.

The following table lists the possible combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The TrunkTest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TrunkTest INVOKE Parameters				Timer: TTT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	
SeizureType		M	2.214	

The TrunkTest operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TrunkTest RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.74   TrunkTestDisconnect

The TrunkTestDisconnect (TTESTDISC) operation is used by an MSC to request that the designated trunk at a remote MSC be disconnected from its test configuration (e.g., loop-back).

The following table lists the possible combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The TrunkTestDisconnect operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

TrunkTestDisconnect INVOKE Parameters				Timer: TTDT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	

The TrunkTestDisconnect operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

TrunkTestDisconnect RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.75 Unblocking

The Unblocking (UNBLOCKING) operation is used to inform an MSC of the reinsertion into service of a certain circuit.

The following table lists the possible combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	MSC	MSC

The Unblocking operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Unblocking INVOKE Parameters				Timer: UBLKT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
InterMSCCircuitID		M	2.129	

The Unblocking operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

Unblocking RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.76 UnreliableRoamerDataDirective

The UnreliableRoamerDataDirective (`UNRELDIR`) operation is used by the HLR to inform a VLR that it has experienced a failure which has rendered its roaming MS data unreliable.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	HLR	Serving VLR

The UnreliableRoamerDataDirective operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

UnreliableRoamerDataDirective INVOKE Parameters				Timer: URDDT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
MSCID (HLR)		O	2.151	a
SenderIdentificationNumber		O	2.215	b

Notes:

    a.   Include on *IS-41-C* and later.

    b.   Include to identify the functional entity sending the message.

The UnreliableRoamerDataDirective operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

UnreliableRoamerDataDirective RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	zero octets	M	520-1.3.2.2	
Contents				

2.77 UnsolicitedResponse

The UnsolicitedResponse (UNSOLRES) operation is used by a Border MSC to notify neighboring MSCs that an unsolicited or unexpected page response has been received from an MS, that the MS's presence in the Border MSC has been confirmed, and that a TLDN has been assigned.

The following table lists the valid combinations of invoking and responding FEs.

	INVOKING FE	RESPONDING FE
Case 1	Border MSC	Serving MSC

The UnsolicitedResponse operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

UnsolicitedResponse INVOKE Parameters				Timer: URT
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.1	
Length	variable octets	M	520-1.3.2.1	
Contents				
BillingID (Anchor)		M	2.23	
ElectronicSerialNumber		M	2.112	
MSID		M	2.153	d
CDMAServiceOption		O	2.66	e
Digits (Destination)		O	2.105	a
ExtendedMSCID (Border MSC)		O	2.116	a
ExtendedSystemMyTypeCode (Border MSC)		O	2.117	a
PC_SSN (Border MSC)		O	2.176	a, b
SystemAccessType		O	2.258	c
TDMAServiceCode		O	2.273	e

Notes:

a. Include if Temporary Local Directory Number (TLDN) is available.

b. Include if SS7 is used.

c. Include for *IS-41-C* or later.

d. Include the identifier with which the MS accessed the system, unless that identifier was a MIN-based IMSI, in which case the MobileIdentificationNumber (populated with the MIN derived from that IMSI) should be included.

e. Include to indicate the service type in which the MS responded to a page.

The UnsolicitedResponse operation success is reported with a TCAP RETURN RESULT (LAST). This is carried by a TCAP RESPONSE package. The Parameter Set is encoded as follows:

UnsolicitedResponse RETURN RESULT Parameters				
Field	**Value**	**Type**	**Reference**	**Notes**
Identifier	SET [NATIONAL 18]	M	520-1.3.2.2	
Length	variable octets	M	520-1.3.2.2	
Contents				
AccessDeniedReason		O	2.1	j
AlertCode		O	2.4	a
BillingID (Originating)		O	2.23	b
CallingPartyName		O	2.29	g
CallingPartyNumberDigits1		O	2.30	d
CallingPartyNumberDigits2		O	2.31	d
CallingPartyNumberString1		O	2.32	c
CallingPartyNumberString2		O	2.33	c
CallingPartySubaddress		O	2.34	c
DisplayText		O	2.106	g, i
DisplayText2		O	2.107	g, i
DMH_AccountCodeDigits		O	2.108	d
DMH_AlternateBillingDigits		O	2.109	d
DMH_BillingDigits		O	2.110	d
ExtendedMSCID (Originating MSC)		O	2.116	e
ExtendedSystemMyTypeCode (Originating MSC)		O	2.117	f
LegInformation		O	2.133	g
MobileDirectoryNumber		O	2.139	d
MSCIdentificationNumber (Origination MSC)		O	2.152	g
OneTimeFeatureIndicator		O	2.167	g
PC_SSN (Originating MSC)		O	2.176	h
PilotBillingID		O	2.177	g
PilotNumber		O	2.178	g
PreferredLanguageIndicator		O	2.179	g
RedirectingNumberDigits		O	2.198	d
RedirectingNumberString		O	2.199	c
RedirectingPartyName		O	2.200	g
RedirectingSubaddress		O	2.201	c
TerminationTreatment		O	2.282	g
TerminationTriggers		O	2.283	g
TriggerAddressList		O	2.286	g

Notes:

a. Include to specify special alerting treatment.

b. Include for subsequent call redirection at the originating MSC and for recording purposes (see *DMH*).

c. Include if related feature is active.

d. Include if available.

e. Include to identify originating system.

f. Include to identify originating system manufacturer.

g. Include if available (e.g., provided in the associated RoutingRequest INVOKE).

h. Include if SS7 may be used for subsequent call redirection.

i. Include only one of these mutually exclusive parameters.

j. Include when the operation cannot be completed (e.g. MS responded to a page in the border system with a service type that differs from the one used by the system that paged). If present other parameters may be ignored.

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