

ISO/IEC 18051:2007-12 (E)

Information technology - Telecommunications and information exchange between systems - Services for Computer Supported Telecommunications Applications (CSTA) Phase III

Contents		Page
Foreword		xi
Introduction		xii
1	Scope	1
2	Conformance	1
2.1	Switching Function	1
2.1.1	Conformant Services	2
2.1.2	Conformant Events	2
2.1.3	CSTA Profiles	2
2.1.4	Support of Service Requests And Manual Mode	5
2.2	Special Resource Function Conformance	5
2.2.1	Conformant Services	6
2.2.2	Conformant Events	6
2.2.3	Support of Service Requests And Manual Mode	6
2.3	Computing Function Conformance	6
3	References	7
4	Definitions and Abbreviations	8
5	Functional Architecture	8
6	CSTA Operational Model	8
6.1	Switching Sub-Domain Model	9
6.1.1	Device	9
6.1.2	Call	42
6.1.3	Connection	49
6.1.4	Call State Definitions	53
6.1.5	Referencing Devices, Elements, Appearances and Device Configurations	54
6.1.6	Management of Dynamically-Assigned Identifiers	56
6.2	I/O Services	56
6.2.1	Data Path Definition	57
6.2.2	I/O Registration Services	58
6.2.3	Data Path States and Operational Model	58
6.2.4	I/O Services Example	58
6.3	Call Detail Record (CDR) Services	59
6.3.1	CDR Services Examples	59
6.4	Capabilities Exchange	61
6.4.1	Switching Function Capabilities	62
6.4.2	Device Capabilities	62
6.4.3	Dynamic Feature Availability	62
6.5	Switching Function Information Synchronization	63
6.5.1	Switching Function Level Information	63
6.5.2	Device Level Information	63
6.5.3	Call Level Information	63
6.6	Status Reporting Services	64
6.6.1	System Status	64

6.6.2	Monitoring	65
6.6.3	Snapshot Services	69
6.7	Additional Services, Features & Behaviour	69
6.7.1	Forwarding	69
6.7.2	Connection Failure	71
6.7.3	Recall	73
6.7.4	Call Back	74
6.7.5	External Calls	74
6.7.6	Tracking a Diverted Call	75
6.7.7	Media Stream Access	75
6.7.8	Routeing Services	79
6.7.9	Device Maintenance	84
6.7.10	Prompting	84
6.7.11	Telephony Tones Features	84
6.7.12	DTMF and Rotary Pulse Digits Features	85
6.7.13	Data Collection Services	85
7	Association Establishment	85
7.1	Implicit Association created using CSTA System Status service (initiated by Switching Function) 86	
	7.2 Implicit Association created using CSTA Request System Status service	86
7.3	Explicit Association created using ACSE	87
7.4	Explicit Association created using Ecma Application Session (ECMA-354) Services	88
8	Security Service	89
9	Generic Service Requirements	89
9.1	Service Request	89
9.2	Service Response (Acknowledgements)	90
9.2.1	Positive Acknowledgement Models	90
9.2.2	Negative Acknowledgement	91
9.3	Diagnostic Error Definitions	91
9.3.1	Error Categories	91
9.3.2	Error Values	92
9.4	Vendor Specific Extensions	93
9.4.1	Private Data	93
9.4.2	Escape Services and Private Event	94
9.5	General Services and Event Functional Requirements	95
9.5.1	Services	95
9.5.2	Events	97
10	CSTA Device Identifier Formats	97
10.1	Device Identifier Formats	97
10.1.1	Diallable Digits	98
10.1.2	Switching Function Representation	99
10.1.3	Device Number	101
10.1.4	URI Representation	101
10.2	Functional Requirements	101
11	Template Descriptions	102
11.1	Service Template	102
11.1.1	Service Description	102
11.1.2	Service Request	103
11.1.3	Service Response	103
11.1.4	Operational Model	103
11.2	Event Template	104
11.2.1	Event Description	104
11.2.2	Event Parameters	104
11.2.3	Event Causes	104
11.2.4	Functional Requirements	104
11.3	Parameter Type Template	104
11.3.1	Parameter Type Description	105

11.3.2	Format	105
11.3.3	Functional Requirements	105
12	Parameter Types	105
12.1	Definitions	105
12.2	Defined Parameter Types	106
12.2.1	AccountInfo	107
12.2.2	AgentPassword	107
12.2.3	AuthCode	107
12.2.4	CallCharacteristics	108
12.2.5	CallLinkageData	108
12.2.6	CallQualifyingData	110
12.2.7	ChargingInfo	110
12.2.8	ConnectionInformation	111
12.2.9	ConnectionList	112
12.2.10	CorrelatorData	112
12.2.11	CSTAPrivateData	113
12.2.12	CSTASecurityData	114
12.2.13	DeviceHistory	114
12.2.14	ErrorValue	115
12.2.15	EventCause	126
12.2.16	LanguagePreferences	129
12.2.17	LocalConnectionState	130
12.2.18	MediaCallCharacteristics	130
12.2.19	MediaServiceType	132
12.2.20	MessageInfo	133
12.2.21	MonitorFilter	134
12.2.22	ServicesPermitted	134
12.2.23	SimpleCallState	135
12.2.24	SubjectOfCall	135
12.2.25	SystemStatus	136
12.2.26	TimeInfo	136
12.2.27	UserData	136
12.3	Identifier Parameter Types	137
12.3.1	AgentID	138
12.3.2	AssociatedCalledDeviceID	138
12.3.3	AssociatedCallingDeviceID	139
12.3.4	AuditoryApparatusID	139
12.3.5	ButtonID	140
12.3.6	CalledDeviceID	140
12.3.7	CallingDeviceID	140
12.3.8	CDRCrossRefID	141
12.3.9	ConnectionID	141
12.3.10	DCollCrossRefID	143
12.3.11	DeviceID	143
12.3.12	DisplayID	143
12.3.13	EscapeRegisterID	143
12.3.14	HookswitchID	144
12.3.15	IOCrossRefID	144
12.3.16	IORegisterReqID	144
12.3.17	LampID	144
12.3.18	MediaServiceInstanceID	145
12.3.19	MediaStreamID	145
12.3.20	MessageID	145
12.3.21	MonitorCrossRefID	145
12.3.22	NetworkCalledDeviceID	145
12.3.23	NetworkCallingDeviceID	146
12.3.24	RedirectionDeviceID	146
12.3.25	ResourceID	147
12.3.26	RingerID	147
12.3.27	RouteingCrossRefID	147
12.3.28	RouteRegisterReqID	148

12.3.29	ServiceCrossRefID	148
12.3.30	SubjectDeviceID	148
12.3.31	SysStatRegisterID	149
13	Capability Exchange Services	149
13.1	Services	149
13.1.1	Get CSTA Features	149
13.1.2	Get Logical Device Information	151
13.1.3	Get Physical Device Information	161
13.1.4	Get Switching Function Capabilities	165
13.1.5	Get Switching Function Devices	180
13.1.6	Switching Function Devices	182
14	System Services	186
14.1	Registration Services	186
14.1.1	Change System Status Filter	186
14.1.2	System Register	188
14.1.3	System Register Abort	190
14.1.4	System Register Cancel	191
14.2	Services	193
14.2.1	Request System Status	193
14.2.2	System Status	195
14.2.3	Switching Function Capabilities Changed	196
14.2.4	Switching Function Devices Changed	197
15	Monitoring Services	198
15.1	Services	198
15.1.1	Change Monitor Filter	199
15.1.2	Monitor Start	200
15.1.3	Monitor Stop	204
16	Snapshot Services	205
16.1	Services	205
16.1.1	Snapshot Call	205
16.1.2	Snapshot Device	209
16.1.3	Snapshot CallData	211
16.1.4	Snapshot DeviceData	213
17	Call Control Services & Events	215
17.1	Services	215
17.1.1	Accept Call	216
17.1.2	Alternate Call	218
17.1.3	Answer Call	221
17.1.4	Call Back Call-Related	223
17.1.5	Call Back Message Call-Related	226
17.1.6	Camp On Call	229
17.1.7	Clear Call	231
17.1.8	Clear Connection	234
17.1.9	Conference Call	237
17.1.10	Consultation Call	241
17.1.11	Deflect Call	246
17.1.12	Dial Digits	249
17.1.13	Directed Pickup Call	252
17.1.14	Group Pickup Call	255
17.1.15	Hold Call	259
17.1.16	Intrude Call	261
17.1.17	Join Call	265
17.1.18	Make Call	269
17.1.19	Make Predictive Call	274
17.1.20	Park Call	279
17.1.21	Reconnect Call	282
17.1.22	Retrieve Call	285

17.1.23	Send Message	286
17.1.24	Single Step Conference Call	291
17.1.25	Single Step Transfer Call	295
17.1.26	Transfer Call	298
17.2	Events	301
17.2.1	Bridged	301
17.2.2	Call Cleared	303
17.2.3	Conferenced	306
17.2.4	Connection Cleared	311
17.2.5	Delivered	315
17.2.6	Digits Dialed	320
17.2.7	Diverted	322
17.2.8	Established	327
17.2.9	Failed	332
17.2.10	Held	337
17.2.11	Network Capabilities Changed	339
17.2.12	Network Reached	342
17.2.13	Offered	346
17.2.14	Originated	351
17.2.15	Queued	354
17.2.16	Retrieved	358
17.2.17	Service Initiated	359
17.2.18	Transferred	362
18	Call Associated Features	366
18.1	Services	366
18.1.1	Associate Data	367
18.1.2	Cancel Telephony Tones	369
18.1.3	Change Connection Information	370
18.1.4	Generate Digits	373
18.1.5	Generate Telephony Tones	375
18.1.6	Send User Information	377
18.2	Events	379
18.2.1	Call Information	380
18.2.2	Charging	382
18.2.3	Digits Generated	383
18.2.4	Telephony Tones Generated	384
18.2.5	Service Completion Failure	386
19	Media Attachment Services & Events	389
19.1	Services	389
19.1.1	Attach Media Service	389
19.1.2	Detach Media Service	392
19.2	Events	395
19.2.1	Media Attached	395
19.2.2	Media Detached	396
20	Routeing Services	398
20.1	Registration Services	399
20.1.1	Route Register	399
20.1.2	Route Register Abort	401
20.1.3	Route Register Cancel	402
20.2	Services	403
20.2.1	Re-Route	403
20.2.2	Route End	404
20.2.3	Route Reject	406
20.2.4	Route Request	408
20.2.5	Route Select	410
20.2.6	Route Used	412
21	Physical Device Features	414
21.1	Services	414

21.1.1	Button Press	415
21.1.2	Get Auditory Apparatus Information	416
21.1.3	Get Button Information	419
21.1.4	Get Display	420
21.1.5	Get Hookswitch Status	422
21.1.6	Get Lamp Information	424
21.1.7	Get Lamp Mode	426
21.1.8	Get Message Waiting Indicator	428
21.1.9	Get Microphone Gain	429
21.1.10	Get Microphone Mute	430
21.1.11	Get Ringer Status	432
21.1.12	Get Speaker Mute	434
21.1.13	Get Speaker Volume	435
21.1.14	Set Button Information	436
21.1.15	Set Display	437
21.1.16	Set Hookswitch Status	440
21.1.17	Set Lamp Mode	441
21.1.18	Set Message Waiting Indicator	442
21.1.19	Set Microphone Gain	444
21.1.20	Set Microphone Mute	445
21.1.21	Set Ringer Status	446
21.1.22	Set Speaker Mute	448
21.1.23	Set Speaker Volume	449
21.2	Events	451
21.2.1	Button Information	451
21.2.2	Button Press	452
21.2.3	Display Updated	452
21.2.4	Hookswitch	454
21.2.5	Lamp Mode	454
21.2.6	Message Waiting	455
21.2.7	Microphone Gain	456
21.2.8	Microphone Mute	457
21.2.9	Ringer Status	457
21.2.10	Speaker Mute	458
21.2.11	Speaker Volume	459
22	Logical Device Features	460
22.1	Services	460
22.1.1	Call Back Non-Call-Related	461
22.1.2	Call Back Message Non-Call-Related	462
22.1.3	Cancel Call Back	463
22.1.4	Cancel Call Back Message	465
22.1.5	Get Agent State	466
22.1.6	Get Auto Answer	468
22.1.7	Get Auto Work Mode	469
22.1.8	Get Callback	470
22.1.9	Get Caller ID Status	472
22.1.10	Get Do Not Disturb	473
22.1.11	Get Forwarding	474
22.1.12	Get Last Number Dialed	478
22.1.13	Get Routeing Mode	479
22.1.14	Set Agent State	480
22.1.15	Set Auto Answer	484
22.1.16	Set Auto Work Mode	486
22.1.17	Set Caller ID Status	487
22.1.18	Set Do Not Disturb	489
22.1.19	Set Forwarding	490
22.1.20	Set Routeing Mode	492
22.2	Events	494
22.2.1	Agent Busy	494
22.2.2	Agent Logged Off	495
22.2.3	Agent Logged On	496

22.2.4	Agent Not Ready	497
22.2.5	Agent Ready	498
22.2.6	Agent Working After Call	499
22.2.7	Auto Answer	500
22.2.8	Auto Work Mode	501
22.2.9	Call Back	502
22.2.10	Call Back Message	502
22.2.11	Caller ID Status	503
22.2.12	Do Not Disturb	503
22.2.13	Forwarding	504
22.2.14	Routeing Mode	506
23	Device Maintenance Events	507
23.1	Events	507
23.1.1	Back In Service	507
23.1.2	Device Capabilities Changed	508
23.1.3	Out Of Service	508
23.1.4	Partially In Service	509
24	I/O Services	510
24.1	Registration Services	511
24.1.1	I/O Register	511
24.1.2	I/O Register Abort	512
24.1.3	I/O Register Cancel	513
24.2	I/O Services	514
24.2.1	Data Path Resumed	515
24.2.2	Data Path Suspended	516
24.2.3	Fast Data	517
24.2.4	Resume Data Path	519
24.2.5	Send Broadcast Data	520
24.2.6	Send Data	522
24.2.7	Send Multicast Data	524
24.2.8	Start Data Path	526
24.2.9	Stop Data Path	528
24.2.10	Suspend Data Path	529
25	Data Collection Services	531
25.1	Services	531
25.1.1	Data Collected	531
25.1.2	Data Collection Resumed	534
25.1.3	Data Collection Suspended	535
25.1.4	Resume Data Collection	536
25.1.5	Start Data Collection	537
25.1.6	Stop Data Collection	539
25.1.7	Suspend Data Collection	540
26	Voice Services & Events	541
26.1	Services	541
26.1.1	Activate	541
26.1.2	Clear	543
26.1.3	Concatenate Message	544
26.1.4	Deactivate	545
26.1.5	Delete Message	546
26.1.6	Play Message	547
26.1.7	Query Voice Attribute	549
26.1.8	Queue	554
26.1.9	Record Message	555
26.1.10	Reposition	557
26.1.11	Resume	559
26.1.12	Review	560
26.1.13	Set Voice Attribute	562
26.1.14	Start	565

26.1.15	Stop	567
26.1.16	Suspend	569
26.1.17	Synthesize Message	571
26.2	Events	572
26.2.1	Bookmark Reached	573
26.2.2	Completed	574
26.2.3	DTMF Detected	574
26.2.4	Emptied	575
26.2.5	Interruption Detected	576
26.2.6	Not Recognized	576
26.2.7	Play	577
26.2.8	Recognized	578
26.2.9	Record	579
26.2.10	Review	580
26.2.11	Silence Timeout Expired	580
26.2.12	Speech Detected	581
26.2.13	Started	582
26.2.14	Stop	582
26.2.15	Suspend Play	583
26.2.16	Suspend Record	584
26.2.17	Voice Attribute Changed	585
26.2.18	Voice Error Occurred	587
27	Call Detail Record (CDR) Services	588
27.1	Services	588
27.1.1	Call Detail Records Notification	589
27.1.2	Call Detail Records Report	590
27.1.3	Send Stored Call Detail Records	595
27.1.4	Start Call Detail Records Transmission	596
27.1.5	Stop Call Detail Records Transmission	598
28	Vendor Specific Extensions Services & Events	599
28.1	Registration Services	599
28.1.1	Escape Register	599
28.1.2	Escape Register Abort	600
28.1.3	Escape Register Cancel	601
28.2	Services	603
28.2.1	Escape	603
28.2.2	Private Data Version Selection	604
28.3	Events	605
28.3.1	Private Event	605
Annex A (normative)	Device Appearances	607
Annex B (normative)	ISDN User-User Information Element Encoding for CSTA	615
Annex C (normative)	Capability Bitmap Parameters Types	617
Annex D (informative)	Connection State Transition Examples	683
Annex E (informative)	Summary of changes in this edition	692