ECMA Technical Report TR/80

June 2000

ECMA

Standardizing Information and Communication Systems

Migrating to CSTA Phase III

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Brief History

All of the Standards and Technical Reports in the Suite are based on practical experience of ECMA member companies and each one represents a pragmatic and widely based consensus.

This Technical Report is intended to assist in the migration from Phase I and II of CSTA to Phase III of CSTA by outlining major areas of enhancement that are now part of the CSTA Phase III suite.

The evolution of this Suite began with CSTA Phase I, which included only the CSTA Services and Protocol Standards (ECMA-179 and ECMA-180). In Phase II, Technical Report ECMA TR/68 was added illustrating how CSTA Services and events might be used in typical call scenarios.

This Technical Report has been adopted by the ECMA General Assembly of June 2000.

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1   Scope

The purpose of this Technical Report is to aid the transition to CSTA Phase III by those who are already familiar with Phases I and II.

Phase III of CSTA extends the previous Phase II Standard in major theme directions as well as numerous details. Major areas of advancement include:

- New categories of services and events.

- Additional services and events for call and device control.

- Enhancement to existing services and events.

- Organisation of services and events to reflect a grouping based on function (call control, device control, etc.)

- Use of a consistent template for services and events that includes initial/final Connection State, connection state transitions, event monitoring sequences, etc.

2   References

The references used in this Technical Report are defined in the following section.

CSTA Services:	ECMA-269	Services for Computer Supported Telecommunications Applications (CSTA) Phase III 4th Edition (June 2000)
CSTA Protocol:	ECMA-285	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase III 2nd Edition (June 2000)
Phase II Services:	ECMA-217	Services for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)
Phase II Protocol:	ECMA-218	Protocol for Computer Supported Telecommunications Applications (CSTA) Phase II (December 1994)
Phase I Services:	ECMA-179	Services for Computer Supported Telecommunications Applications (CSTA) (June 1992)
Phase I Protocol:	ECMA-180	Protocol for Computer Supported Telecommunications Applications (CSTA) (June 1992)

3   Introduction

This Technical Report is intended only as a guide for the transition to CSTA Phase III and is not a comprehensive restatement of the Standard from which implementations may be built.

4   Map of services and events

Summary of comparable and new Services & Events for CSTA Phase III, giving the names of the services or event of Phase III and indicating if these services or events existed at Phase II (Ph II) and/or Phase I (Ph I) of CSTA.

Phase III Service or Event Name	Ph II	Ph I
Get Logical Device Information		
Get Physical Device Information	✓⊩	✓⊩
Get Switching Function Capabilities		
Get Switching Function Devices		
Switching Function Devices		
Change System Status Filter		
System Register		
System Register Abort		
System Register Cancel		
Request System Status		
Switching Function Capabilities Changed		
Switching Function Devices Changed		
System Status	✓	✓
Change Monitor Filter	✓	✓
Monitor Start	✓	✓
Monitor Stop	✓	✓
Snapshot Call	✓	✓
Snapshot Device	✓	✓
Snapshot CallData		
Snapshot DeviceData		
Accept Call		
Alternate Call	✓	✓
Answer Call	✓	✓
Call Back - Call Related	✓⊩	✓⊩
Call Back Message - Call Related	✓⊩	
Camp On Call	✓⊩	✓⊩
Clear Call	✓	✓
Clear Connection	✓	✓
Conference Call	✓	✓
Consultation Call	✓	✓
Deflect Call	✓⊩	✓⊩
Dial Digits		
Directed Pickup Call	✓⊩	✓⊩

Phase III Service or Event Name	Ph II	Ph I
Group Pickup Call	✓⊩	✓⊩
Hold Call	✓	✓
Intrude Call	✓⊩	✓⊩
Join Call		
Make Call	✓	✓
Make Predictive Call	✓	✓
Park Call	✓	
Reconnect Call	✓	✓
Retrieve Call	✓	✓
Single Step Conference Call	✓	
Single Step Transfer Call	✓	
Transfer Call	✓	✓
Bridged		
Call Cleared	✓	✓
Conferenced	✓	✓
Connection Cleared	✓	✓
Delivered	✓	✓
Digits Dialed		
Diverted	✓	✓
Established	✓	✓
Failed	✓	✓
Held	✓	✓
Network Capabilities Changed		
Network Reached	✓	✓
Offered		
Originated	✓	✓
Queued	✓	✓
Retrieved	✓	✓
Service Initiated	✓	✓
Transferred	✓	✓
Associate Data	✓	
Cancel Telephony Tones		
Generate Digits	✓	
Generate Telephony Tones		
Send User Information		

⊩ Part of another service

Phase III Service or Event Name	Ph II	Ph I
Call Information	✓	
Charging		
Digits Generated		
Telephony Tones Generated		
Service Completion Failure		
Attach Media Service		
Detach Media Service		
Media Attached		
Media Detached		
Route Register		
Route Register Abort		
Route Register Cancel		
Re-Route	✓	✓
Route End	✓	✓
Route Reject		
Route Request	✓	✓
Route Select	✓	✓
Route Used	✓	✓
Button Press		
Get Auditory Apparatus Information		
Get Button Information		
Get Display		
Get Hookswitch Status		
Get Lamp Information		
Get Lamp Mode		
Get Message Waiting Indicator	✓	✓
Get Microphone Gain		
Get Microphone Mute	✓	
Get Ringer Status		
Get Speaker Mute	✓	
Get Speaker Volume	✓	
Set Button Information		
Set Display		
Set Hookswitch Status		
Set Lamp Mode		

Phase III Service or Event Name	Ph II	Ph I
Set Message Waiting Indicator	✓	✓
Set Microphone Gain		
Set Microphone Mute	✓	
Set Ringer Status		
Set Speaker Mute	✓	
Set Speaker Volume	✓	
Button Information		
Button Press		
Display Updated		
Hookswitch		
Lamp Mode		
Message Waiting	✓	✓
Microphone Gain		
Microphone Mute	✓	
Ringer Status		
Speaker Mute	✓	
Speaker Volume	✓	
Call Back - Non Call Related		
Call Back Message - Non Call Related		
Cancel Call Back		
Cancel Call Back Message		
Get Agent State	✓	✓
Get Auto Answer	✓	
Get Auto Work Mode		
Get Caller ID Status		
Get Do Not Disturb	✓	✓
Get Forwarding	✓	✓
Get Last Number Dialled		✓
Get Routeing Mode	✓	
Set Agent State	✓	✓
Set Auto Answer	✓	
Set Auto Work Mode		
Set Caller ID Status		
Set Do Not Disturb	✓	✓
Set Forwarding	✓	✓

Phase III Service or Event Name	Ph II	Ph I
Set Routeing Mode	✓⁂	
Agent Busy	✓	✓
Agent Logged Off	✓	✓
Agent Logged On	✓	✓
Agent Not Ready	✓	✓
Agent Ready	✓	✓
Agent Working After Call	✓	✓
Auto Answer	✓	✓
Auto Work Mode		
Call Back		
Call Back Message		
Caller ID Status		
Do Not Disturb	✓	✓
Forwarding	✓	
Routing Mode		
Back In Service	✓	✓
Device Capability Changed		
Out of Service	✓	✓
I/O Register		
I/O Register Abort		
I/O Register Cancel		
Data Path Resumed	✓	
Data Path Suspended	✓	
FastData	✓	
Resume Data Path	✓	
Send Broadcast Data	✓	
Send Data	✓	
Send Multicast Data	✓	
Start Data Path	✓	
Stop Data Path	✓	
Suspend Data Path	✓	
Data Collected		
Data Collection Resumed		
Data Collection Suspended		
Resume Data Collection		

Phase III Service or Event Name	Ph II	Ph I
Start Data Collection		
Stop Data Collection		
Suspend Data Collection		
Concatenate Message	✓	
Delete Message	✓	
Play Message	✓	
Query Voice Attribute	✓	
Record Message	✓	
Reposition	✓	
Resume	✓	
Review	✓	
Set Voice Attribute	✓	
Stop	✓	
Suspend	✓	
Synthesize Message	✓	
Play	✓	
Record	✓	
Review	✓	
Stop	✓	
Suspend Play	✓	
Suspend Record	✓	
Voice Attributes Change	✓	
Call Detail Notification		
Call Detail Recording Report		
Send Stored Call Detail Records		
Start Call Detail Records Trans.		
Stop Call Detail Records Trans.		
Escape Register		
Escape Register Abort		
Escape Register Cancel		
Escape	✓	
Private Data Version Selection		
Private Event	✓	

4.1 Capability Exchange Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Get Logical Device Information	Obtains the current set of logical device information for a given device identifier.		
Get Physical Device Information	Obtains the current set of physical device information for a given device identifier.	Query Device (Device Information)	Query Device (Device Information)
Get Switching Function Capabilities	Obtains the current set of capabilities for the entire switching function.		
Get Switching Function Devices	Obtains the devices in the application working domain (i.e. devices that can be controlled and/or observed).		
Switching Function Devices	Provides the actual list of devices in the application working domain (i.e. devices that can be controlled and/or observed).		

4.2 System Status Registration Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Change System Status Filter	Changes the system status filter options for a current system registration.		
System Register	Registers the computing function for system services with the switching function.		
System Register Abort	Indicates that the switching function has terminated a system registration.		
System Register Cancel	Unregisters the computing function for system services with the switching function.		

4.3 System Status Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Request System Status	Request to query the system status of the function receiving the request (bi-directional).		
System Status	Request that reports the status of the function issuing the request to the function receiving the request.	System Status	System Status
Switching Function Capabilities Changed	Request that reports that switching function level capability information (available via the Get Switching Function Capability service) has changed.		
Switching Function Devices Changed	Request that reports that information associated with the current set of devices that can be controlled and observed in the switching sub-domain (available via the Get Switching Domain Devices service) has changed.		

4.4   Monitoring Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Change Monitor Filter	Modifies the event filter for an existing monitor.	Change Monitor Filter	Change Monitor Filter
Monitor Start	Initiates an event monitor on a specified device or call.	Monitor Start	Monitor Start
Monitor Stop	Terminates an existing monitor.	Monitor Stop	Monitor Stop

4.5   Snapshot Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Snapshot Call	Provides information about the devices participating in a specified call.	Snapshot Call	Snapshot Call
Snapshot Device	Provides information on the status of calls at a specific device.	Snapshot Device	Snapshot Device
Snapshot CallData	Provides Snapshot Call Information in segmented messages.		
Snapshot DeviceData	Provides Snapshot Device Information in segmented messages.		

4.6   Call Control Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Accept Call	Causes an offered call to transition to the Ringing or Entering Distribution mode of the Alerting state.		
Alternate Call	Places an existing call on hold and then retrieves a previously held or alerting call at the same device.	Alternate Call	Alternate Call
Answer Call	Answers a call that is ringing, queued, or being offered to a device.	Answer Call	Answer Call
Call Back - Call Related	Allows a computing function to request that an originally called device return a call to the original calling device.	Call Completion (Call Back)	Call Completion (Call Back)
Call Back Message - Call Related	Allows a computing function to instruct the switching function to leave a pre-defined message requesting that the called device call the calling device.	Call Completion (Call Back Message)	
Camp On Call	Queues a call at a busy device until the device becomes available.	Call Completion (Camp On)	Call Completion (Camp On)
Clear Call	Releases all of the devices associated with the specified call.	Clear Call	Clear Call
Clear Connection	Releases a specific device from a call.	Clear Connection	Clear Connection

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Conference Call	Provides a conference of an existing held call and another active call at a conferencing device. The two calls are merged into a single call at the conferencing device.	Conference Call	Conference Call
Consultation Call	Places an existing active call at a device on hold and initiates a new call from the same device.	Consultation Call	Consultation Call
Deflect Call	Deflects a call to another device.	Divert Call (Deflection)	Divert Call (Deflection)
Dial Digits	Dials a digit sequence for a call that already has been initiated.		
Directed Pickup Call	Picks a specified call. (Moves and connects a specified alerting or queued call.)	Divert Call (Directed Pickup)	Divert Call (Directed Pickup)
Group Pickup Call	Picks a call from a specified pick group. (Moves and connects any alerting call in a pick group to another device).	Divert Call (Group Pickup)	Divert Call (Group Pickup)
Hold Call	Places a specific connection on hold.	Hold Call	Hold Call
Intrude Call	Allows a computing function to add the calling device to a call at a busy called device.	Call Completion (Intrude)	Call Completion (Intrude)
Join Call	Allows a computing function to request, on behalf of a device, that the device be joined into an existing call.		
Make Call	Establishes a call between two devices.	Make Call	Make Call
Make Predictive Call	Establishes a call between two devices. The calling device is presented with the call only after the called device is alerted or has answered the call.	Make Predictive Call	Make Predictive Call
Park Call	Parks a call at a specific device. (Moves and queues a connected call to another device).	Park Call	
Reconnect Call	Clears an existing connection and then connects a previously held connection at the same device.	Reconnect Call	Reconnect Call
Retrieve Call	Connects to a call that had previously been placed on hold.	Retrieve Call	Retrieve Call
Single Step Conference Call	Adds a device to an existing call.	Single Step Conference	
Single Step Transfer Call	Replaces a device in an existing call with another device.	Single Step Transfer	
Transfer Call	Transfers a held call to the consulted party.	Transfer Call	Transfer Call

4.7   Call Control Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Bridged	Indicates that an appearance at a shared device configuration has been placed into an inactive mode (i.e. queued state).		
Call Cleared	Indicates that all devices have been removed from an existing call.	Call Cleared	Call Cleared
Conferenced	Indicates that the conferencing device has conferenced itself or another device with an existing call.	Conferenced	Conferenced
Connection Cleared	Indicates that a device in a call has disconnected or dropped out from a call.	Connection Cleared	Connection Cleared
Delivered	Indicates that a call is being presented to a device in either the Ringing or Entering Distribution modes of the Alerting state.	Delivered	Delivered
Digits Dialed	Indicates that a call or feature is being attempted from a device and that a portion of the dialling sequence has been completed.		
Diverted	Indicates that a call has been diverted from a device.	Diverted	Diverted
Established	Indicates that a device has answered or has been connected to a call.	Established	Established
Failed	Indicates that a call cannot be completed and/or a connection has entered the Fail state.	Failed	Failed
Held	Indicates that an existing call has been put on hold.	Held	Held
Network Capabilities Changed	Indicates that a situation occurred during a call's progress in a public or private network that modifies its signalling capability (i.e. inter-networking).		
Network Reached	Indicates that a call has been connected to an external network using a Network Interface Device (e.g. trunk, CO Line, etc.).	Network Reached	Network Reached
Offered	Indicates that a call is in a pre-delivery state at a device (prior to ringing indication or delivering ringback, for example).		
Originated	Indicates that a call is being attempted from a device.	Originated	Originated
Queued	Indicates that a call has been queued.	Queued	Queued
Retrieved	Indicates that a previously held call has been retrieved.	Retrieved	Retrieved
Service Initiated	Indicates that a device has gone off-hook for service or is being prompted to go offhook.	Service Initiated	Service Initiated
Transferred	Indicates that an existing call has been transferred to another device and that the device transferring the call has been dropped from the call.	Transferred	Transferred

4.8 Call Associated Feature Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Associate Data	Associates information (such as correlator data, account code, authorisation code, call qualifying data, etc.) with a specified call.	Associate Data	
Cancel Telephony Tones	Cancels a telephony tone that is being generated on a specified connection.		
Generate Digits	Generates DTMF tones or rotary pulses on behalf of a connection in a call.	Send DTMF Tones	
Generate Telephony Tones	Generates the specified telephony tone on behalf of a connection in a call.		
Send User Information	Sends user-to-user information from the specified connection to the other device in the call.		

4.9 Call Associated Feature Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Call Information	Indicates that call associated information (such as correlator data, account code, authorisation code, call qualifying data, etc.) has been collected for a call.	Call Information	
Charging	Indicates that new charging information has arrived for a device in a call.		
Digits Generated	Indicates that (DTMF or rotary pulse) digits have been generated.		
Telephony Tones Generated	Indicates that telephony tones have been generated.		
Service Completion Failure	Indicates that a previous multi-step computing function initiated service request has failed before the service's successful completion conditions were satisfied.		

4.10 Media Attachment Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Attach Media Service	Attaches a media service instance to a call.		
Detach Media Service	Detaches a media service instance from a call.		

4.11   Media Attachment Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Media Attached	Indicates that a media service instance has been attached to a call.		
Media Detached	Indicates that a media service instance has been detached from a call.		

4.12   Route Registration Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Route Register	Registers the computing function as a routing server for a specified routing device or for the entire switching function.		
Route Register Abort	Indicates that the switching function has terminated a routing server registration.		
Route Register Cancel	Unregisters the computing function as a routing server.		

4.13   Routing Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Re-Route	This service requests an alternate destination from the one provided by a previous Route Select service and based on previous information provided for the call.	Re-Route	Re-Route
Route End	This service ends a routeing dialogue.	Route End	Route End
Route Reject	This service is sent to the switching function during a routeing dialogue to indicate that a call should be returned to the network for alternate routeing.		
Route Request	This service requests that the computing function provides a destination for a call. To aid in the selection of a destination, the service request includes the current destination and may include additional information.	Route Request	Route Request
Route Select	This service is used by the computing function to provide the destination requested by a previous Route Request or Re-Route request.	Route Select	Route Select
Route Used	This service provides the actual destination for a call that has been routed using the Route Select service with its optional parameter that requests the route that was used.	Route Used	Route Used

4.14   Physical Device Feature Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Button Press	Simulates the activation of a specified button on a device.		
Get Auditory Apparatus Information	Get information on one or all auditory apparatuses at a specified device.		
Get Button Information	Get the button information for either a specified button or all buttons on a device.		
Get Display	Get a snapshot of the contents of the display of a specified device.		
Get Hookswitch Status	Get the hookswitch status of a specified device.		
Get Lamp Information	Get the lamp information for either a specified lamp or all lamps on a device.		
Get Lamp Mode	Get the lamp mode status of a specified button on a device.		
Get Message Waiting Indicator	Get the message waiting status of a specified device.	Query Device (Message Waiting)	Query Device (Message Waiting)
Get Microphone Gain	Get the microphone gain setting at a specified device.		
Get Microphone Mute	Get the microphone mute status at a specified device.	Query Device (Microphone Mute)	
Get Ringer Status	Get the ringer status (ringing/not ringing, ring count, ring pattern, ring volume) of one or all ringers associated with a device.		
Get Speaker Mute	Get the speaker status of a specified device.	Query Device (Speaker Mute)	
Get Speaker Volume	Get the speaker volume setting of a specified device.	Query Device (Speaker Volume)	
Set Button Information	Set the button information of a specified button on a device.		
Set Display	Set the display on a specified device.		
Set Hookswitch Status	Set the hookswitch status of a specified device.		
Set Lamp Mode	Set the lamp mode status of a specified button on a device.		
Set Message Waiting Indicator	Set the message waiting status of a specified device.	Set Feature (Message Waiting)	Set Feature (Message Waiting)
Set Microphone Gain	Set the microphone gain setting of a specified device.		
Set Microphone Mute	Set the microphone mute status of a specified device.	Set Feature (Microphone Mute)	
Set Ringer Status	Set the specified ringer to ring or not to ring. May also be used to set the ring pattern and ring volume of a ringer at a specified device.		

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Set Speaker Mute	Set the speaker mute status of a specified device.	Set Feature (Speaker Mute)	
Set Speaker Volume	Set the speaker volume setting of a specified device.	Set Feature (Speaker Volume)	

4.15 Physical Device Feature Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Button Information	The information associated with a button on a device has changed.		
Button Press	A button has been pressed.		
Display Updated	The contents of a device's display has changed.		
Hookswitch	A hookswitch status has changed.		
Lamp Mode	The lamp mode status of a particular lamp has changed.		
Message Waiting	The message waiting status has changed.	Message Waiting	Message Waiting
Microphone Gain	The microphone gain setting has changed for one of the hookswitches.		
Microphone Mute	The microphone mute status has changed for one of the hookswitches.	Microphone Mute	
Ringer Status	The ringer attribute associated with a device has changed.		
Speaker Mute	The speaker mute status has changed for one of the hookswitches.	Speaker Mute	
Speaker Volume	The speaker volume setting has changed for one of the hookswitches.	Speaker Volume	

4.16 Logical Device Features Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Call Back - Non Call Related	Requests that the switching domain originate a call back call between two devices.		
Call Back Message - Non Call Related	Requests that the switching function leave a pre-defined message requesting that the target device call the originating device.		
Cancel Call Back	Cancels a previous (or all) Call Back feature at a device.		
Cancel Call Back Message	Cancels a previous (or all) Call Back Message feature at a device.		
Get Agent State	Get the agent state of a specified device.	Query Device (Agent State)	Query Device (Agent State)

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Get Auto Answer	Get the auto-answer status of a specified device.	Query Device (Auto Answer)	
Get Auto Work Mode	Get the auto-work mode status of a specified device.		
Get Caller ID Status	Get the Caller ID status of a specified device.		
Get Do Not Disturb	Get the do not disturb status of a specified device.	Query Device (Do Not Disturb)	Query Device (Do Not Disturb)
Get Forwarding	Get the forwarding status of a specified device.	Query Device (Forward)	Query Device (Forward)
Get Last Number Dialled	Get the last number dialled at a specified device.		Query Device (Last Number)
Get Routeing Mode	Get the routeing mode at a specified device.	Query Device (Routing Enabled)	
Set Agent State	Set the agent state of a specified device.	Set Feature (Agent Parameter)	Set Feature (Agent Parameter)
Set Auto Answer	Set the auto-answer status of a specified device.	Set Feature (Auto Answer)	
Set Auto Work Mode	Set the auto-work mode status of a specified device.		
Set Caller ID Status	Set the Caller ID Status at the specified device.		
Set Do Not Disturb	Set the do not disturb status of a specified device.	Set Feature (Do Not Disturb)	Set Feature (Do Not Disturb)
Set Forwarding	Set the forwarding status of a specified device.	Set Feature (Forward)	Set Feature (Forward)
Set Routeing Mode	Set the routeing mode of a specified device.	Set Device (Routeing Enabled)	

4.17   Logical Device Feature Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Agent Busy	An agent is occupied with serving an ACD call.	Agent Busy	Agent Busy
Agent Logged Off	An agent has logged off of an ACD group or an ACD device.	Agent Logged Off	Agent Logged Off
Agent Logged On	An agent has logged on to an ACD group or an ACD device.	Agent Logged On	Agent Logged On
Agent Not Ready	An agent is unavailable and cannot receive incoming ACD calls.	Agent Not Ready	Agent Not Ready
Agent Ready	An agent is available for an ACD call.	Agent Ready	Agent Ready
Agent Working After Call	An agent is involved with after call work and cannot receive ACD calls.	Agent Working After Call	Agent Working After Call
Auto Answer	The auto-answer status has changed.	Auto-Answer	Auto-Answer
Auto Work Mode	The auto-work mode status has changed.		
Call Back	The call back feature status has changed.		

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Call Back Message	The call back message status has changed.		
Caller ID Status	The Caller ID status has been changed for a device.		
Do Not Disturb	The do not disturb status has changed.	Do Not Disturb	Do Not Disturb
Forwarding	The forwarding status has changed.	Forwarding	Forwarding
Routing Mode	The routeing mode status has changed.		

4.18   Device Maintenance Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Back In Service	Indicates that the device has been returned to service.	Back In Service	Back In Service
Device Capability Changed	Indicates that the device level information has changed.		
Out of Service	Indicates that the device has entered a maintenance state (i.e., has been taken out of service).	Out Of Service	Out Of Service

4.19   I/O Registration Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
I/O Register	Registers the computing function as an I/O server for a specified device or for the entire switching function.		
I/O Register Abort	Specifies that the switching function has terminated an I/O server registration.		
I/O Register Cancel	Unregisters the computing function as an I/O server.		

4.20   I/O Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Data Path Resumed	The Data Path Resumed service provides information that a previously suspended data path has been resumed.	Data Path Resumed	
Data Path Suspended	The Data Path Suspended service provides information that a data path has been suspended.	Data Path Suspended	
FastData	The Fast Data service starts a data path for only the duration of sending one data message.	FastData	
Resume Data Path	The Resume Data Path requests the switching function to resume a currently suspended data path.	Resume Data Path	
Send Broadcast Data	The Send Broadcast Data service writes to all open data paths for a given application association and data path type.	Send Broadcast Data	
Send Data	The Send Data service writes data to a specified data path.	Send Data	

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Send Multicast Data	The Send Multicast Data service writes to multiple data paths.	Send Multicast Data	
Start Data Path	The Start Data Path service starts a data path on the specified object.	Start Data Path	
Stop Data Path	The Stop Data Path service terminates an existing data path.	Stop Data Path	
Suspend Data Path	The Suspend Data Path suspends a specified data path but does not destroy the data path.	Suspend Data Path	

4.21 Data Collection Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Data Collected	The Data Collected service provides information (e.g., telephony tones, DTMF digits) that was received over a connection as part of the data collection.		
Data Collection Resumed	The Data Collection Resumed service provides information that a previously suspended data collection has been resumed.		
Data Collection Suspended	The Data Collection Suspended service provides information that a data collection has been suspended.		
Resume Data Collection	The Resume Data Collection service requests the switching function to resume a currently suspended data collection.		
Start Data Collection	The Start Data Collection service starts data collection on a connection.		
Stop Data Collection	The Stop Data Collection service terminates an existing data collection.		
Suspend Data Collection	The Suspend Data Collection service suspends a specified data collection but does not destroy the data collection.		

4.22 Voice Unit Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Concatenate Message	The Concatenate Message service combines multiple messages, in the sequence provided, into a single resulting message.	Concatenate Message	
Delete Message	The Delete Message service deletes a specified voice message.	Delete Message	
Play Message	The Play Message service plays a voice message on a particular Connection.	Play Message	

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Query Voice Attribute	The Query Voice Attribute obtains the current value of a specified voice attribute for a specified message.	Query Voice Attribute	
Record Message	The Record Message service starts recording a voice message from a specified connection.	Record Message	
Reposition	The Reposition service moves the current position pointer forward or backward a specified number of milliseconds in a message.	Reposition	
Resume	The Resume service restarts the playing or recording of a previously suspended message at its current position.	Resume	
Review	The Review service plays a portion of a voice message during a recording session.	Review	
Set Voice Attribute	The Set Voice Attribute service sets a voice attribute for a specified connection and message.	Set Voice Attribute	
Stop	The Stop service stops playing or recording of a message and resets the position pointer to the beginning of the message.	Stop	
Suspend	The Suspend service temporarily stops the playing or recording of the current message and leaves the position pointer at its current location.	Suspend	
Synthesize Message	The Synthesize Message service constructs a voice message from a text message.	Synthesize Message	

4.23   Voice Unit Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Play	The Play event indicates that a message is being played.	Play	
Record	The Record event indicates that a message is being recorded.	Record	
Review	The Review event indicates that a message is being reviewed.	Review	
Stop	The Stop event indicates that a message play or record operation on a connection has stopped.	Stop	
Suspend Play	The Suspend Play event indicates that a message is suspended in play.	Suspend Play	
Suspend Record	The Suspend Record event indicates that a message is suspended during record.	Suspend Record	
Voice Attributes Change	The Voice Attribute changed event indicates that one or more attributes of a message has changed.	Voice Attributes Change	

4.24   Call Detail Record (CDR) Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Call Detail Records Notification	The Call Detail Records Notification service notifies the computing function that it should obtain the CDR information that has been stored by the switching function (by using the Send Stored Call Detail Records service).		
Call Detail Recording Report	The Call Detail Records Report service provides CDR information to the computing function.		
Send Stored Call Detail Records	The Send Stored Call Detail Records service initiates the transfer of stored CDR information to the computing function.		
Start Call Detail Records Trans.	The Start Call Detail Records Transmission service starts the transmission of CDR information.		
Stop Call Detail Records Trans.	The Stop Call Detail Records Transmission service cancels a previously initiated Call Detail Records Transmission.		

4.25   Vendor Specific Registration Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Escape Register	Registers the computing function for escape services with the switching function.		
Escape Register Abort	Indicates that the switching function has terminated an escape service registration.		
Escape Register Cancel	Unregisters the computing function for escape services with the switching function.		

4.26   Vendor Specific Services

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Escape	Provides a mechanism to send a non-standardized feature.	Escape	Escape
Private Data Version Selection	Provides the switching function with the selected version for private data.		

4.27   Vendor Specific Events

CSTA Phase III	Feature Description	CSTA Phase II	CSTA Phase I
Private Event	Provides a mechanism to send implementation-specific extended information event.	Private Event	Private Event

5   Summary of significant areas of change

5.1   Call and Connection State Modelling

- The Call model is now defined for each individual service & event [CSTA Services; 17, 18, 19, 20]

- The initial and final states for services and events are now fully specified [CSTA Services; 11.1, 11.2]

5.2   Additional/Enhanced Features

5.2.1   Correlator Data

- Rules now define the use and continuity of Correlator Data [CSTA Services; 6.1.4.3, 12.2.10]

5.2.2   User Data

- This is a new optional mechanism to support call-related computing function-to-computing function information that, unlike Correlator Data, is not associated with a call for the life of the call [CSTA Services; 6.1.4.4, 12.2.22]

5.2.3   Dynamic Feature Availability

- Provides a new optional mechanism to provide the actual set of CSTA services that can be applied to a connection at a given point [CSTA Services; 6.5.3, 12.2.18]

5.3   Additional Conformance Criteria

- Switching Function Capabilities service must be supported [CSTA Services; 2.1]

- Profiles have been added as the basis of conformance [CSTA Services; 2.1.3]

5.4   Generic Service Requirements, etc.

- Now distinguishes between Atomic and Multi-step service behaviours [CSTA Services; 9.2]

5.5   ACD and ACD Agent Modelling

- Rules now define how ACD agents behave and how associated parameters should be used [CSTA Services; 6.1.3.7]

- Three possible models for ACD behaviour have been introduced [CSTA Services; 6.1.3.7.5]

- A new Pending condition allows delaying the transition to the new agent state until the agent is no longer Busy or Working After Call [CSTA Services; 22.1.5, 22.1.13, 22.2.1, 22.2.6, Annex C]

5.6   Call Detail Recording Services

- Defines a new set of services to allow access to information regarding call details that have been collected, processed and/or stored by the switching function [CSTA Services; 6.4, 27]

5.7   Capability Exchange Services

- This is a new mechanism which has been added to allow the Computing Function to learn what the Switching Function is able to support as modelled via the CSTA interface [CSTA Services; 13]

- Additional mechanisms are provided to allow synchronisation of the capabilities view after the initial exchange [CSTA Services; 6.6]

5.8   Data Collection Services

- These are new services to collect information such as DTMF/rotary pulse digits and Telephony Tones received by a device over a connection [CSTA Services; 6.8.13, 25]

5.9   Registration of Services

The following services now include a registration procedure to manage the receipt of service requests by the Computing Function:

- I/O services [CSTA Services; 6.3.2, 24.1]

- System Status services [CSTA Services; 6.7.1.1, 14.1]

- Routeing services [CSTA Services; 6.8.8.1, 20.1]

- Escape services [CSTA Services; 9.4.2.1, 28.1]

5.10 Device Elements

The CSTA Device has been partitioned into its Logical and Physical Elements to aid visibility and control of devices and device configurations.

5.10.1 Logical Device Feature Services

- The logical element of a CSTA Device encompasses the set of attributes/features/services (e.g., Make Call, Set Forward) that have any association with the control and observation of a call at a CSTA Device [CSTA Services; 6.1.3, 22]

5.10.2 Physical Device Feature services

- The physical element represents the attributes of the physical components and their associated features/services that make up the user interface of a device (e.g., the components of a telephone set) [CSTA Services; 6.1.3.1, 21]

5.11 Media Stream Access

- The capability to control the information content within a call is called media stream access, or simply, media access. Media access is provided to a computing function by establishing a session with a media service. Common media service capabilities are play/record of voice and audio, automatic speech recognition, text to speech, fax, and data services [CSTA Services; 6.8.7, 19]

5.12 Vendor Specific Extensions

- Additional structure and clarification in usage is given [CSTA Services; 9.4, 28]

5.13 Device Addressing

Expands and clarifies the formats of parameters for identifying devices:

- Switching Function Representation [CSTA Services; 10.1.2]

  This is a new format that defines a string allowing the following addressing components:

  - Name
  - Directory number
  - Sub-address
  - Call appearance
  - Extension number
  - Agent ID

  For example "N<9961010>John Smith".

- Diallable Digits [CSTA Services; 10.1.1]

  This format has been expanded to define a string of digits and dialling commands that can be embedded in the digit string.

  For example "00,14089961010W321".

- Device number [CSTA Services; 10.1.3]

  This format continues to address a device via its device identifier and has been enhanced with additional rules governing its usage.

The above are the possible formats for the contents of the device identifying parameters. The string based formats can be distinguished via their content. Hence the protocol specification for device addressing parameters remains the same as in Phase II.

5.14 Call Linkage Feature

Some CSTA calls can be related to other calls that exist in the same switching sub-domain or in different switching sub-domains. The call linkage feature is an optional feature that provides a reference that can be used to represent such a global call. Also the call linkage feature can optionally provide a reference that can be used to associate different CSTA calls in a call thread (i.e. calls that are logically related). This

information may be used by applications for correlating calls for charging/accounting purposes, or for call reporting purposes, etc. [CSTA Services; 6.1.4.7].

The callLinkageData parameter [CSTA Services; 12.2.5] may be provided by the Switching Function and is an additional parameter for all of the existing call control events [CSTA Services; 17.2], for the response to the Snapshot Call service [CSTA Services; 16.1.1] and for the Call Information event [CSTA Services; 18.2.1].

6 Items of special note

6.1 Services

Some Phase II services/events which had multiple capabilities have now been provided as individual services/events. See tables in clause 3 of this Technical Report to identify these services/events.

6.2 Appearances

Phase III has extended the addressing capabilities of Phases I & II. It can now address:

- Physical elements [CSTA Services; 6.1.3.1, 21]

- Logical elements [CSTA Services; 6.1.3.2, 22]

- Multiple logical appearances and Bridged device configurations [CSTA Services; 6.1.3.2.1, Annex A]

6.3 Initialisation Sequence for Association Establishment

- The initialisation sequence for application association establishment (both implicit and explicit) is now defined [CSTA Services; 7]

- System status is required as part of initialisation sequence [CSTA Services; 7.1,7.2]

- Additional information is provided via ACSE, such as Private Data Versions [CSTA Services; 7.2, CSTA Protocol; 8.2.2]

- Feature negotiation via ACSE is retained but this mechanism is restricted to Phase II features [CSTA Protocol; 8.2.2]

Whilst the Phase II mechanism for feature discovery via ACSE is retained this mechanism is restricted to Phase II features and is now superseded by the Get Switching Function Capabilities [CSTA Services; 13.1.3].

6.4 Domain Information

Phase III continues to use the terms from Phase II but adds a small number of additional terms. One of the terms defined for Phase II is not required in Phase III.

CSTA Phase III	
CSTA Domain [CSTA Services; 6]	none
Application Working Domain [CSTA Services; 6.1.2]	none
none	Security Domain

6.5 Security Information

Whilst Phase II defined the Privilege Attribute Certificate (PAC) and Seal components of security, in Phase III these components are not explicitly defined but may still be supported by a generic Security Information parameter which may hold any security information [CSTA Services; 9].

6.6 Parameters

Phase III parameters for identifying devices have been expanded to provide more granularity [CSTA Services; 12.3].

Phase III parameters	Phase I/II parameters
CallingDeviceID [CSTA Services; 12.3.7]	CallingDeviceID
NetworkCallingDeviceID [CSTA Services; 12.3.23]	
AssociatedCallingDeviceID [CSTA Services; 12.3.3]	
CalledDeviceID [CSTA Services; 12.3.6]	CalledDeviceID
NetworkCalledDeviceID [CSTA Services; 12.3.22]	
AssociatedCalledDeviceID [CSTA Services; 12.3.2]	
DeviceID [CSTA Services; 12.3.11]	DeviceID
AuditoryApparatusID [CSTA Services; 12.3.4]	
ButtonID [CSTA Services; 12.3.5]	
DisplayID [CSTA Services; 12.3.12]	
HookswitchID [CSTA Services; 12.3.14]	
LampID [CSTA Services; 12.3.17]	
RingerID [CSTA Services; 12.3.25]	

There are now 3 types of parameter optionality defined, Mandatory, Optional and now Conditional [CSTA Services; 11.1.3]. If a parameter is Conditional, then there are specific requirements governing when the parameter must be supported. The protocol encodes all Conditional parameters as OPTIONAL.

6.7 Protocol Impacts

Implementers planning migration from Phases I & II will need to examine the parameters in CSTA Protocol which been used, since there may be changes in the following respects:

- The parameter name may have changed,
- The parameter type associated with a parameter name may have changed,
- The parameter type definition may have been enhanced or changed,
- Additional parameters may have been added,
- The optionality of some of the parameters has changed, e.g.
  - LocalConnectionState
  - EventCause.

See inside cover page for obtaining further soft or hard copies.