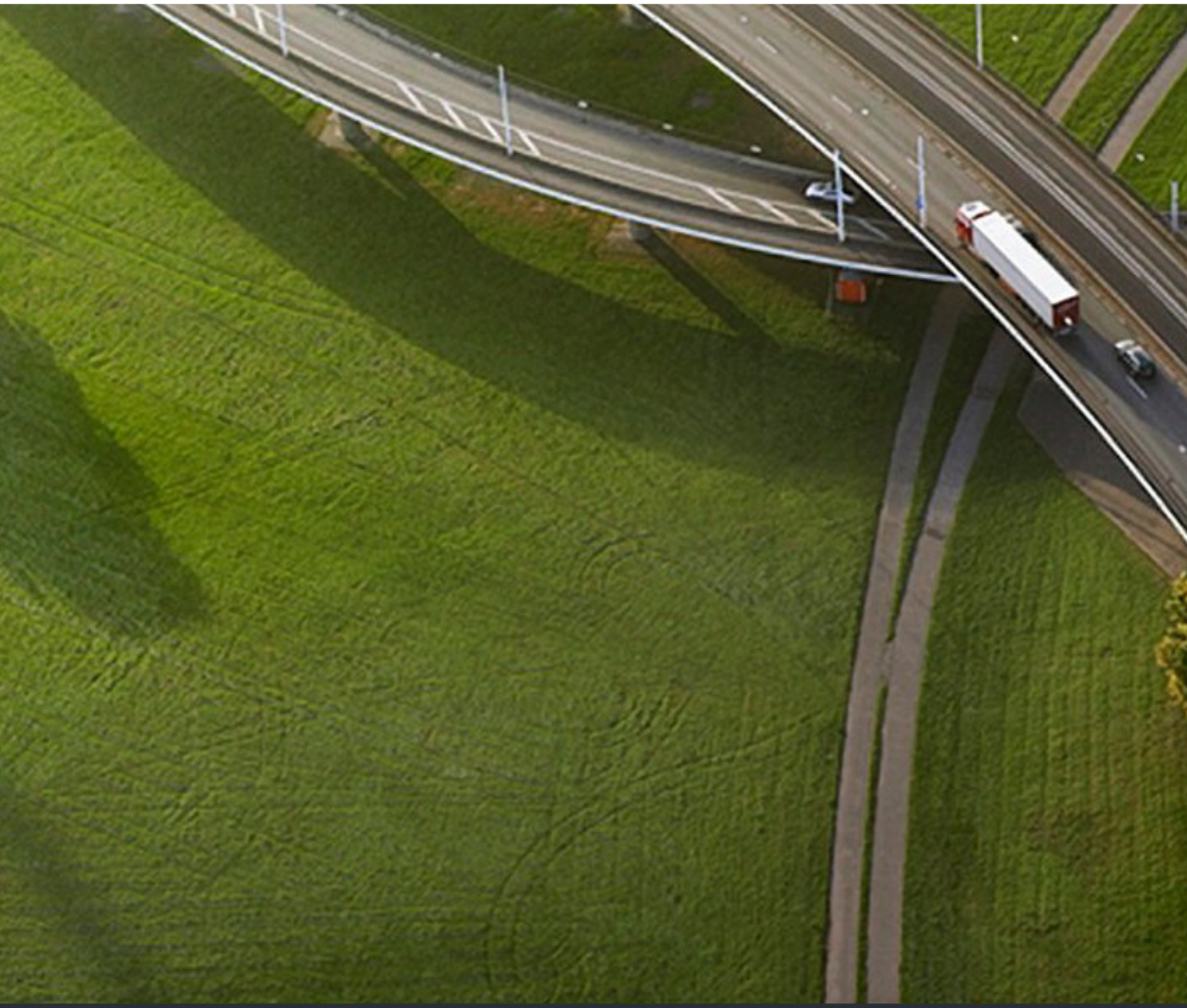
UNIFY Harmonize your enterprise



OpenScape Voice V5 Interface Manual

Interface Manual: Volume 4, CSTA Interface

A31003-H8050-M107-3-76A9

Our Quality and Environmental Management Systems are implemented according to the requirements of the ISO9001 and ISO14001 standards and are certified by an external certification company.

Reference No.: A31003-H8050-M107-3-76A9

unify.com

UNIFY Harmonize your enterprise

Contents

History of Changes

Issue	Date	Changes
1	September 2010	See Section 1.3, “What’s New in OpenScape Voice V5.0” for major changes..

2	September 2011	• CSTA out of service events sent when subscribers are in suspended mode
		  • Section 1.3, “What’s New in OpenScape Voice V5.0”
		  • Section 4.12.1, “Events”
		  • Section 4.12.1.3, “Out of Service”
		• Hyperlinks to external Standards documents moved to Section 1.4, “References”. Sections within the document that had external documentation Hyperlinks, have been updated with cross-references to the Standards document under Section 1.4, “References”.

1 Introduction to this Guide

1.1 Scope

The OpenScape Voice CSTA Interface Specification defines the CSTA Services that allow functional integration between any CSTA-enabled application (computing function) and OpenScape Voice (switching function).

The information in this specification is based on a suite of ECMA CSTA Standards and Technical Reports (Refer to European Computer Manufacturers Association (ECMA)). The ECMA CSTA specification provides a comprehensive description of the architectural and practical issues involved in applying, implementing, and utilizing CSTA-based CTI applications.

The OpenScape Voice basic CSTA Interface Specification consists of the following parts:

- **PART I - CSTA Service Description** is written in a format similar to ECMA 269 and ECMA 354 and defines specific OpenScape Voice CSTA Service implementation characteristics.
- **PART II - CSTA Event Flows** are written in a format similar to ECMA TR/82 and describes specifics call flows between a CSTA-enabled application and the OpenScape Voice. *These event flows are provided as examples and are subject to change without notice to third-party application providers.*

Unless otherwise stated, supported OpenScape Voice CSTA services are compliant with the operational requirements described in the ECMA standards and technical reports listed in Section 1.4, “References”.

1.2 Audience

It is assumed that the reader of this specification has a basic working knowledge of ECMA CSTA standards and technical reports. The ECMA International web site provides an excellent CSTA highlights presentation (Refer to European Computer Manufacturers Association (ECMA))

1.3 What's New in OpenScape Voice V5.0

The following describes new features for OSV V5 and backward compatibility statement for the CSTA Interface:

Callback – Call Related and Non-Call Related

- CSTA event flows are backward compatible with V4R1. Event flows showing optional new capabilties are available.
- Answer call is now possible on A-side Callback Recall.
- Callback Non-Call Related service support callback to the last call device only. A hardcoded targetDevice deviceID "CCB" may be used to invoke call to last called device. If a deviceID is provided by the application the service will be successful only if the provided deviceID was the same as the last called device.
- Callback Call Related service is now supported.
- The targetDevice in the Call Back Event now include displayNumber and Name.
- Call Back Call Related service included in servicesPermitted. Refer to section 2.6.3 for details.

Refactored display services to improve number modification and presentation

and

Numbering test tool and simplified administration

- Feature is backward compatible for CSTA applications
- This feature includes internal enhancements that provides discreet A- and B-side number and name information for Internal, External and Associated (OND, MLHG, Subscriber Re-routing) data for better management of display information.

Note: One Number Service Device (OND) is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (refer to Appendix F, "One Number Service (ONS)" for further details).

- The Park – Manual – Park to Server feature deviceID presentation now uses a hard-coded deviceID for system park slot: N<ABC1>Park Slot". This deviceID is not addressable. Ref to PART II CSTA Interface for enhanced event flows.

Support '+' in Translation

- This feature is backward compatible for CSTA applications.

- Plus (+) is now supported in translation tables.
- If the Forwarding target is set using GNF then it will
- The GNF replacement RTP parameter is automatically as default.
  See section 3.2.8.

CSTA Enhancements for Keyset Operation

- This feature is backward compatible for applications that do not support keyset phones with shared lines.
- Introduces keyOperation privateData tag and removes keyOperation cause code. The private data tag informs applications when primary line device is NOT involved in the call and only secondary line appearance(s) are using primary DN.
- Enhances line reservation event flow.
- Enhances Bridge Call event flow.
- Introduces privateData tag "keyOperation" that along with an empty servicesPermitted parameter indicates when only shared lines are in use on a call.
  See PART II of CSTA Interface Specification for details.

Note: Unique Connection ID for in conferenced event for Bridged Call has been implemented.

CSTA: Ensure unique connectionIDs for Conference and Transfer Event connection lists

- This feature adds new SFR name tags to resolve issues with duplicate connectionIDs:
  - keyID tag is used when a secondary line appearance is involved in call This feature mainly impacts applications shared keyset lines are used.
  - uid tag is used to resolve unique connectionID issues when network devices are involved in transfer and conference calls
- Multiple contact event flows was enhanced by suppressing peer (B-side) events when the calling and called deviceID are the same. This enhancement results in an event flow that does not impact application and that enables the application to still control the call.
  See PART II of CSTA Interface Specification for details.

Speaker Call OSV - OSV and OSV - 4K Interworking

- This feature is backward compatible but provides optional information that enable the application to identify intercom calls, if necessary.

- A new privateData tag "intercom" is presented in events related to a speaker call connection. Applications could use this private data tag to identify the speaker call feature.
- This feature exposes 1-way and 2-way speaker calling. Applications could use flow direction parameter presented in the subject connection information. Transmit or Receive indicates 1-way speaker call and Transmit&Receive indicates 2-way.
- 1-way and 2-way speaker calls are invoked by manually dialing or via Make Call a provisioned prefix access code <PAC + COM group number.
- If the called device does not support handfree operation the event flow will revert to a normal two party call.
- Call Transfer, Blind/Single Step Transfer and Conference services are not permitted during an intercom call.
- The CSTA event flows are illustrated in PART II of CSTA Interface Specification for details.

QSIG Enhancements for H4K Interworking. (Intrusion, Feat. Override, Hunt Group)

- The DAKS intrusion feature is backward compatible with Silent Monitoring and Barge-In event flow.
- A new callCharacteristic = "highPriorityCall" has been added to differentiate a DAKS Emergency Intrusion call.
- Executive Intrusion may be invoked via CSTA Make Call with access code. The resulting event flows are backward compatible with Barge-In.
- The CSTA event flows are illustrated in PART II of CSTA Interface Specification for details.

CSTA out of service events sent when subscribers are in suspended mode

1. CSTA out of services events will be generated when a subscriber enters the 'suspended' state.
   - The subscriber is associated with a proxy
   - The subscriber and the proxy are not reachable
   - The Suspended state is detected when a the associated proxy is not reachable and
     a) The registration expired
     b) A call to the subscriber failed
2. When a call is re-routed due to CAC restriction (CAC 0)

- The call id of the initial call shall be signaled in the re-routed call Offered, Delivered, Established events as CSTA private data (relatedCLD).

1.4 References

1.4.1 External CSTA Documentation

Unless stated otherwise, supported OpenScape Voice CSTA services are compliant with the operational requirements described in the ECMA standards and technical reports listed here.

1. **European Computer Manufacturers Association (ECMA)**
   Computer Supported Telecommunications Applications (CSTA)
   http://www.ecma-international.org/activities/Communications/TG11/cstaIII.htm
2. **ECMA-269**
   Services for Computer Supported Telecommunications Applications (CSTA) Phase III, 7th edition (December 2006)
   http://www.ecma-international.org/publications/standards/Ecma-269.htm
3. **ECMA 354**
   Application Session Service
   First edition / June 2004.
   http://www.ecma-international.org/publications/standards/Ecma-354.htm
4. **ECMA TR/82**
   Scenarios for Computer Supported Telecommunication Applications (CSTA) Phase III, 2nd edition June 2009
   http://www.ecma-international.org/publications/techreports/E-TR-082.htm
5. **ECMA-323**
   XML Protocol for Computer Supported Telecommunications Applications (CSTA) Phase III
   4th edition (December 2006)
   http://www.ecma-international.org/publications/standards/Ecma-323.htm
6. **ECMA TR/72**
   Glossary of definitions and terminology for Computer Supported Telecommunications Applica¬tions (CSTA) Phase III
   3rd edition (June 2000)
   http://www.ecma-international.org/publications/techreports/E-TR-072.htm
7. **ECMA TR/87**
   Using CSTA for SIP Phone User Agents (uaCSTA)
   1st Edition / June 2004
   http://www.ecma-international.org/publications/techreports/E-TR-087.htm

1.4.2 Siemens Enterprise Communications Internal Documentation

- **OpenScape Voice Security Checklist**
  See eDoku for latest version.
- **OpenScape Voice SIP Interface Manuals**
  See eDoku for latest version.
- **OpenScape Voice Feature Interaction Matrix (FIM)**
  See eDoku for latest version.
- **Configuration Guide SIP Phones and Clients for CSTA**
  Contact GVS for latest version.

2 CSTA Service Overview

2.1 OpenScape Voice CSTA Operational Model

OpenScape Voice native CSTA interface is conformant ECMA-269 switching function CSTA service boundary.

OpenScape Voice functions in a limited fashion as a computing function. OpenScape Voice augments its native CSTA interface services with a non-conformant version of ECMA TR/87 SIP User Agent CSTA supported by the Siemens Enterprise Communications OpenStage phone family.

2.2 ECMA CSTA Compliance Statement

Unless otherwise stated, OpenScape Voice CSTA services are compliant with the operational requirements described in the ECMA standards and technical reports listed in Section 1.4, “References”. This specification defines the details regarding specific support by OpenScape Voice.

2.2.1 ECMA-323 Namespace

OpenScape Voice supports ECMA-323 (Edition 4) Namespace and ECMA-269 (Edition 7).

2.2.2 ECMA-323 Specified Tags

The OpenScape Voice-internal CSTA XML encoder/decoder implements a portion of the ECMA-323 Edition 4 CSTA protocol as described in Chapter 4, “OpenScape Voice CSTA Service Description”.

The OpenScape Voice XML schemas are defined in Appendix D, “OpenScape Voice privateData Schema”.

2.3 CSTA Application and OpenScape Voice Configurations

CSTA services are delivered to applications in one of two connectivity configurations. The figure below illustrates the two connectivity configurations supported by the OpenScape Voice CSTA interface:

- Application Direct Connect (Applications A and B).
- Application Platform, such as OpenScape V5 (Applications C and D)

OpenScape Voice is able to support up to 256 simultaneous CSTA interfaces over TCP on 10/100mb Ethernet LAN protocol. Both application connectivity models are supported simultaneously. Applications are responsible for coordinating call control functions when the single device is monitored and controlled by multiple applications.

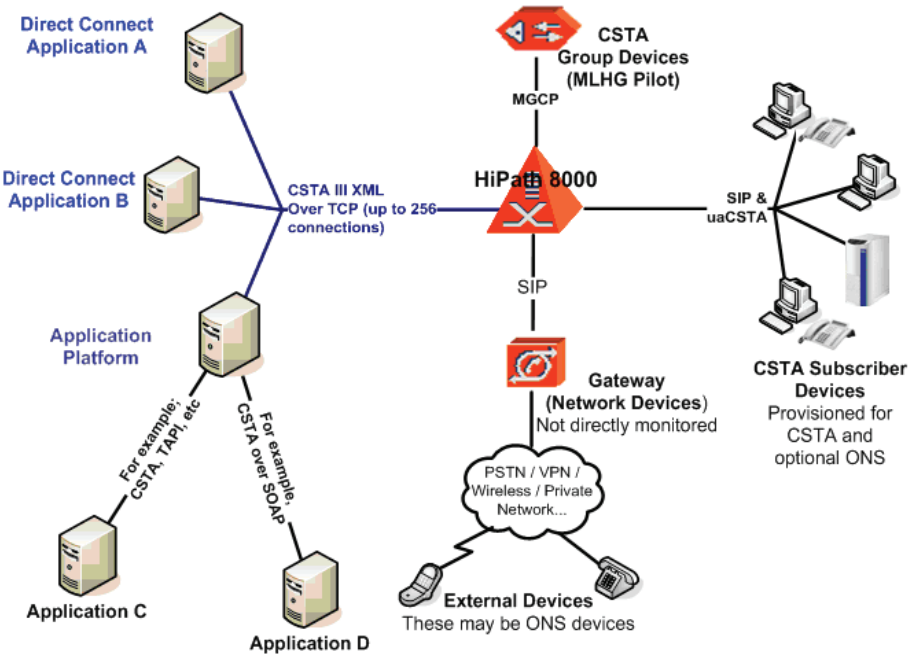


Figure 1 Applic CSTA

2.3.1 Direct Connect Configurations

In this connectivity configuration, applications establish the TCP connections and use the native OpenScape Voice CSTA interface directly. OpenScape Voice supports both direct and application platform connectivity models simultaneously. The direct connection interface is the application interface described in this specification.

2.3.2 CSTA Transport Considerations

2.3.2.1 CSTA over TCP

The OpenScape Voice CSTA TCP interface conforms to ECMA-323 – Appendix G – TCP without SOAP G.2 format.

The CSTA TCP IP address is provisioned in OpenScape Voice as described in Section 3.1, “Application Connectivity” and is known by the application by configuration or discovery using DNS SRV record.

Each CSTA application is responsible to establish CSTA connections on the provisioned TCP IP address.

The CSTA over TCP transport type requires a four-byte Invoke ID used by OpenScape Voice and application to correlate CSTA service request with response messages. The Invoke ID is provided in the TCP message body that precedes the XML instance message as illustrated in the following figure. The invoke ID is encoded as four ASCII numerical characters. A new Invoke ID is created in a CSTA service request message and is repeated in the corresponding service (positive or fault) response message. The value of “9999” is used for CSTA events.

0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0	0	Length		Invoke ID				XML message body

2.3.2.2 CSTA over SIP (for SIMPLE uaCSTA)

CSTA allows a Computing Function to invoke services on certain resources, typically a communications device as identified by a Directory Number (DN) or similar. A Switching Function executes these services and sends responses back to the Computing Function. A Switching Function can also send events reflecting changes of state of resources to the Computing Function at any time, based on a subscription by the Computing Function.

The uaCSTA interface specified in this document is designed to fit into a landscape where there are multiple Computing Functions, some residing in centralized applications and others residing on uaCSTA-enabled SIP clients such as phones or soft clients. Furthermore there is a Switching Function at the B2BUA and additional Switching Functions at uaCSTA-enabled SIP clients.

In a traditional CSTA environment, where uaCSTA is not involved, a Computing Function on a centralized application invokes services on and receives events from the Switching Function on the B2BUA (right hand side only of Figure 1 – Functional landscape with uaCSTA). The blue arrow represents CSTA

communication for this purpose, where the single arrow-head indicates the direction of service requests and the double arrow-head indicates the direction of service responses and events.

In a uaCSTA environment in which a SIP client provides a Switching Function, certain CSTA services that are hard or impossible to execute at the Switching Function within the B2BUA are delegated by the B2BUA to the Switching Function in the SIP client. Examples are Make Call, Hold Call, Send Digits, Set Volume and Set Mute. Here the left hand side of the figure comes into play. The blue arrow represents CSTA communication for this purpose (uaCSTA), where the arrow-heads indicate service requests to the SIP client and services responses from the SIP client. This version of this document does not specify any events generated by the Switching Function in the SIP client.

Thus certain service requests from a Computing Function in a centralized application will be relayed by the B2BUA to the Switching Function in the SIP client, and responses will be sent in the reverse direction. Events will be sent by the Switching Function in the B2BUA to the Computing Function in the application, since the B2BUA will be able to see any resource state changes arising from actions at the Switching Function in the SIP client (e.g., it will see if a SIP call is established).

In a uaCSTA environment in which a SIP client provides a Computing Function, the SIP client is able to invoke certain CSTA services at the Switching Function in the B2BUA. In this version of this document, these are limited to getting and modifying B2BUA settings for call forwarding and DND for the user of the device concerned. When these resources change (e.g., by service request from a Computing Function on a SIP client, by service request from a central application, or by local action at the B2BUA), events will be sent to all interested Computing Functions, including that on the device concerned as well as any central application. The impact of this on the uaCSTA interface is shown by the red arrow on the left hand side of the figure. The red arrow represents CSTA communication for this purpose (uaCSTA), where the single arrow-head indicates the direction of service requests and the double arrow-head indicates the direction of service responses and events. Likewise the red arrow on the right hand side of the figure represents events to the central application arising from service requests by the SIP client.

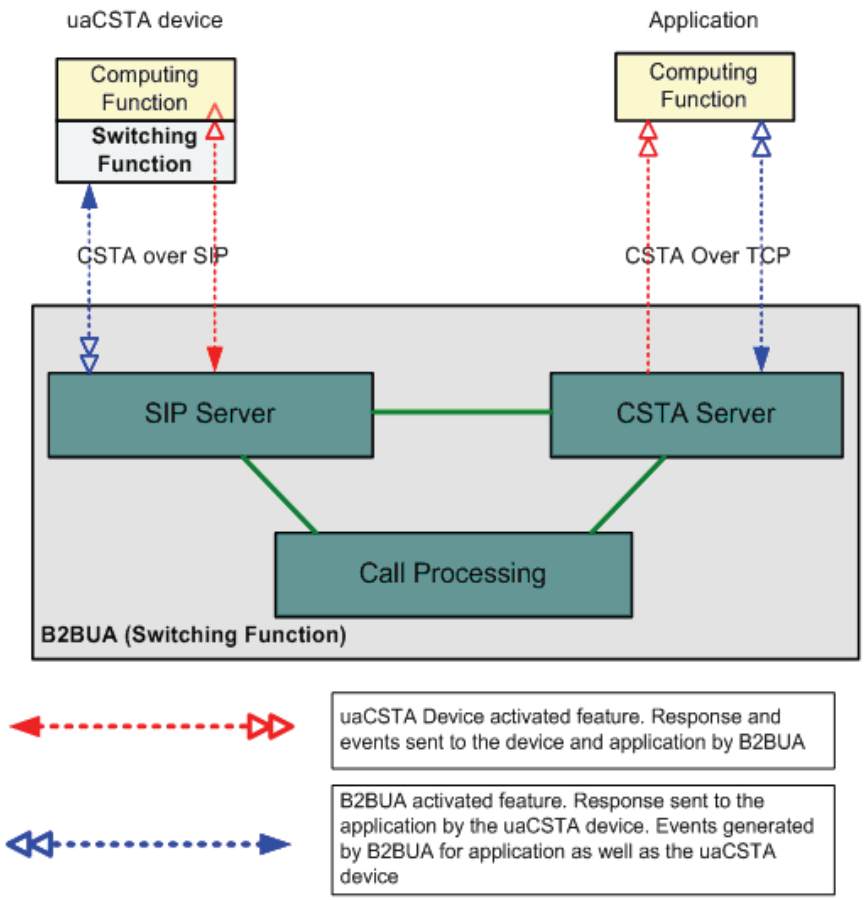


Figure 2 Simple usCSTA B2BUA functionality<

OpenScape Voice supports a limited User Agent CSTA (uaCSTA) interface with OpenStage phones. The interface is based upon the uaCSTA environment where OpenScape Voice is a back-to-back user agent fronting CSTA applications and using uaCSTA to communicate to Siemens Enterprise Communications SIP phones on the back-end. The OpenScape Voice and OpenStage implementation is follows the uaCSTA landscape described in ECMA TR/87 and illustrated below.

CSTA does not use uaCSTA when multiple contacts are registered.

Refer to Section 2.4, “Supported CSTA Services and Events (by Device Type)” for a list of uaCSTA services supported by OpenScape Voice.

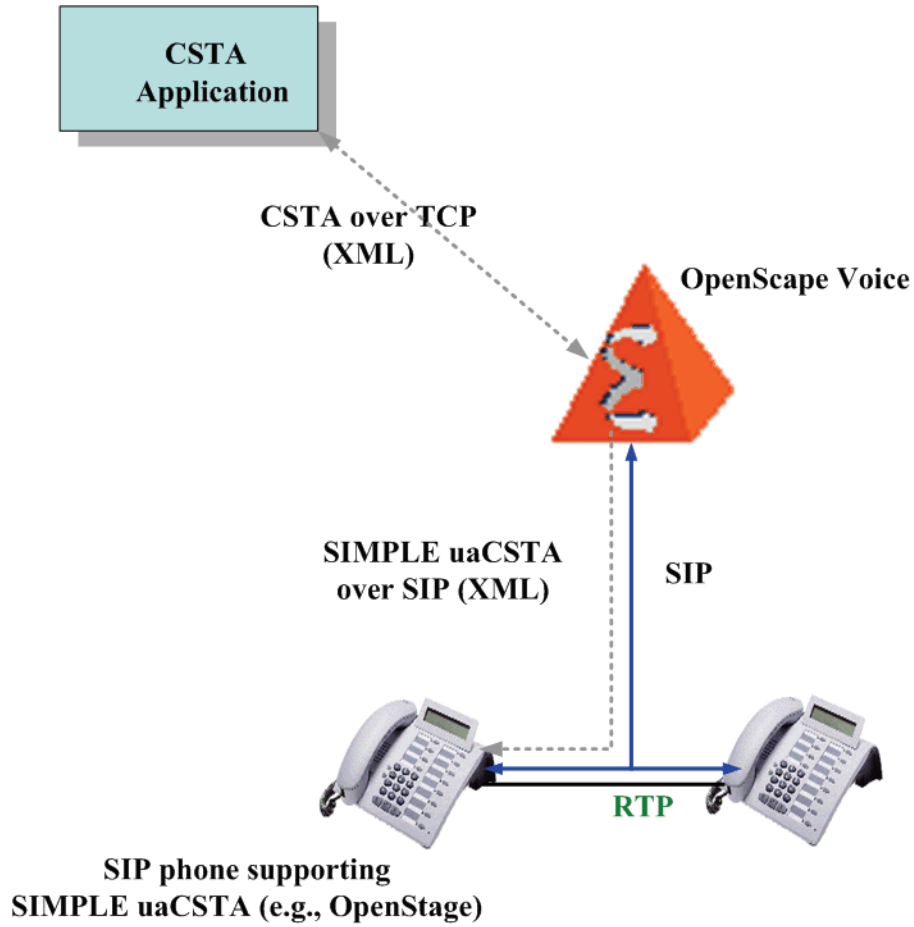


Figure 3 Simple uaCSTA connectivity

The uaCSTA is transported with SIP messages, but not within a specific SIP call dialog. This allows uaCSTA requests to be sent to the phone even if the phone is not currently involved in a call. CSTA over SIP transport is defined an internal OSCAR SIP User Agent specification.

OpenStage phones currently support CSTA over SIP for SIMPLE uaCSTA.

2.3.3 Application Link Security Considerations

2.3.3.1 CSTA Application White List

Access to OpenScape Voice CSTA services is secured by configuring valid and trusted server IP address table (that is, a “white list” of valid IP addresses). The CSTA Signaling Manager does not accept connections from IP addresses not configured in this list.

OpenScape Voice Element Management Command Line Interface (CLI) provides details on configuring denial of service options.

2.3.3.2 Transport Security using IPSec

IPSec is used to implement secure network layer connections between OpenScape Voice and CSTA Applications. Data transmitted over IPSec connections is subject to integrity and authentication checks and is encrypted to prevent eavesdropping. IPSec connections consist of two portions - a security policy that defines the level of security required on a subnet, host, port or protocol basis, and a security association that describes the algorithms and keys used to authenticate and encrypt data transmitted over the connection.

IPSec functionality is integrated into the network stacks of most operating systems. Utilities are provided for administration of IPSec related policies and associations. Key exchange is usually configured using the Internet Key Exchange (IKE) mechanism. An IKE daemon process, provided as part of IPSec system functionality, manages IKE exchanges and the corresponding setup of IPSec associations.

OpenScape Voice Element Management Command Line Interface (CLI) provides details on configuring IPSec Profile Management.

2.3.3.3 Transport Security via TLS

TLS is not currently supported for CSTA TCP connections.

2.4 Supported CSTA Services and Events (by Device Type)

OpenScape Voice supports three (3) CSTA device type categories:

- Normal: for any non-Siemens Enterprise Communications SIP device
- Siemens Type 1
- CSTA over SIP

Table 1 illustrates the recommended CSTA device type for SIP phones and clients.

CSTA Device Type	Siemens Enterprise Communications Phones and Clients				Others
	OptiPoint 410 and 420	OpenStage 20, 40, 60, and 80	OpenScape Desktop Client with SIP Provider	OpenScape Desktop Client Personal or OptiClient 130	Any
Normal					X
Siemens Type 1[1]	X		X	X	
CSTA over SIP		X			

Table 1 Recommended CSTA Device Type for SIP Phones and Clients

1 Subscribers that do not have a physical registering device can still use CSTA and One Number Service (ONS Inbound and Outbound). In this case, it is recommended that Siemens Type 1 be provisioned.

2.5 Recommended CSTA Device Type Settings

Certain CSTA call and device control services are supported (X) by each CSTA device type. Table 2 illustrates the CSTA call and device control services supported by each CSTA device type.

Refer to Appendix C, "Supported CSTA Services and Events by Device Type" for a complete list of services and events supported by device type.

CSTA Device Type	Accept Call	Alternate Call	Answer Call	Clear Connection	Conference Call	Consultation Call	Deflect Call	Hold Call	Reconnect Call	Retrieve Call	Single Step Transfer Call	Transfer Call	Make Call	Generate Digits	Physical Device Caps e.g., Volume, Mute
Normal	X			X		X	X	X		X[1]	X	X	X[2]	X	
Siemens Type 1[3]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
CSTA over SIP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 2 CSTA Call and Device Control Services Supported by CSTA Device Types

1 If a call is placed on hold by the phone, then CSTA retrieve call will work only with Siemens Enterprise Communications phones.
2 Auto-origination (hands-free) is not supported. This means that the calling device must go off-hook manually.
3 Subscribers that do not have a physical registering device can still use CSTA and One Number Service (ONS Inbound and Outbound). In this case, it is recommended that Siemens Type 1 be provisioned.

2.6 Common CSTA Parameter Considerations

This section defines the CSTA service, service response and event parameters supported by OpenScape Voice. As a general rule the conditional and optional parameters are only listed if they are supported by OpenScape Voice. The comment field provides specific usage information as it relates to OpenScape Voice. In most case this information is the same as ECMA-269.

The section references listed below apply to all OpenScape Voice CSTA services and events. These sections provide important details on specific parameter contents, formatting.

- **Supported Event Cause Codes** are defined in each CSTA event subsection description within Section 4, “OpenScape Voice CSTA Service Description”.
- **Supported Device ID Formats** are described in Section 2.6.1, “DeviceID Number and Name Presentation Conventions”.
- **Supported Negative Service Response Codes** are described in Section 2.6.2, “Negative Service Response”.
- **Supported Services Permitted** capabilities are described in Section 2.6.3, “Dynamic Feature Presentation (using servicesPermitted)”.

OpenScape Voice-specific support of CSTA Services is defined in the following sections. Services and events not listed are not supported.

2.6.1 DeviceID Number and Name Presentation Conventions

2.6.1.1 CSTA Device Identification Number

OpenScape Voice encodes the device identifiers (DeviceID) as described in the following sections.

OpenScape Voice supports the deviceID formats listed in the table below. DeviceID encoding the device identifiers (DeviceID) as described in the following subsections.

Device ID Format	Supported
Dialable Digits (DD)	Y
Switching Function Representation (SFR)	Y
Device Number	N
URI	N

Dialable Digits (DD)

The DD format is used by an application in service requests to provide a sequence of dialing characters that is, used to reach a device. OpenScape Voice also uses the DD format in service responses and events and provides the following options:

OpenScape Voice supports the following options for the DD format:

- Supports characters “0” – “9”; characters “*”, “#” and “+”. The comma is supported, but only for the Generate Digits service.
- Permits visual formatting characters such as space, “(“, “)” and “-“from the application. However, visualization formatting characters are ignored and removed by OpenScape Voice signaling manager and not repeated in any service response or events.
- International number format (with leading plus “+”) is supported by OpenScape Voice as a dialable number format. The presentation of international number format without visual formatting characters is also referred to as Global number format (GNF).
- OpenScape Voice may send DD format in CSTA responses and events when no other deviceID information is available, such as, Name, Display Number or OND.

Note: One Number Service Device (OND) is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (refer to Appendix F, “One Number Service (ONS)” for further details).

Examples of DD Formatted DeviceIDs:

- 22343 – a sequence of characters that can be dialed to reach a station. This maybe a fully qualified private network number.
- +1 (123) 555-1212 – a sequence of characters representing an international number (with visual separators)
- 914084922343 – a sequence of characters that includes an access (exit) code to reach an external device
- +15613221234 - a sequence of characters representing a global or international number format.

Switching Function Representation (SFR)

SFR format is a sequence of characters that is, used to reference a device including a directory number, name, and other value added specified addressing attributes supported by OpenScape Voice.

This SFR format may be used in service requests, service responses, and events.

Switching Function Representation (SFR) may be provided when name and number information is provided. OpenScape Voice conforms to SFR format as defined in section 10.1.2 of ECMA-269.

The SFR deviceID is identified by a leading “N” and has the following format:

N<DN/PE>NM;tag=value;tag=value

Table 3 identifies the supported and not supported SFR fields and tags:

Field Name	Supported	Options
Directory Number (DN)	Y	Digits “0” through “9”, “*”. “#”, “+” and readability characters: “-“, “(“, “)”. All other characters shall be ignored. Refer to the Examples of DD Formatted DeviceIDs:. A leading “+” indicates international or global number format Examples of DN formatted deviceIDs: • 22343 - a sequence of characters representing a fully qualified private network number (PNP) or extension that can be dialed to reach an internal or on-net subscriber device. • +1 (123) 555-1212 - a sequence of characters representing an international number (with visual separators) • 914084922343 - a sequence of characters that includes an access (exit) code to reach an external device • +15613221234 - a sequence of characters representing a global or international number format.
Physical Element (PE)	N	Service request with this field will be rejected.
Extension String (/)		

Table 3 SFR Fields and Tags

Field Name	Supported	Options
Name String (NM)	Y	• The NM field begins with a sequence of characters that represents the name of the person associated with the Directory Number. OpenScape Voice only supports calling party name presentation. This field is provided by OpenScape Voice when available. • OpenScape Voice supports multibyte characters primarily for the Chinese market. See Section 2.6.1.4, “Multibyte Support for Name (NM) Field in UTF-8 Encoding”. • ; (semicolon) is the separator character that precedes a tag name. • tag is the specified name of the Name String tag (Tags supported by OpenScape Voice are defined in Table 4). • =value is the assigned value of the tag. Depending upon the tag, this portion may be omitted. Tag and value pairs are repeated in the NM as necessary. OpenScape Voice assumes that if an application does not use a specific tag that it simply ignores it without consequence.

Table 3 SFR Fields and Tags

The following Name String tags are supported by OpenScape Voice. OpenScape Voice ignores any unsupported tag.

Field Name	Supported	Options
displayNumber	Y	Indicates an optimal dialable form of the Directory Number (e.g. extension number, public number with route access code, etc.). This notation is typically a dialable and displayable number used in call information displays and call logs. OpenScape Voice does not provide the displayNumber parameter for deviceIDs portion of a connectionID. The Phone and CSTA number display information should be synchronized. The following rules apply: • If display information is provided to the phone, the CSTA display information must match the display of the phone. • If display information has not been provided to the phone, CSTA attempts to provide display information using number modification API when privacy restrictions are not applicable to the party being displayed. One example of this situation is for Inter-BG call from A to B, where party A does not subscribe to number presentation and B does not have privacy set for Inter-BG calls. In this case, A's phone shows dialed digits, not a modified number. The CSTA Originated event also reflects the dialed digits. However, in the CSTA Delivered event and beyond, the SFR format displayNumber for the called party is the modified number analysis. Refer to OpenScape Voice Assistant – Display Number section for details on provisioning of the number definition table.
prNam	N	Indicates that the name associated with the DeviceID is private and if provided in the Name String, its presentation to end users shall be restricted. There is no value specified for this tag. Refer to Section 2.6.1.3, "Number and Name Display Including Privacy" for Openscape Voice-specific name and number privacy handling.
prNum	N	Indicates that the DN associated with the DeviceID is private and if provided in the Directory Number field, its presentation to end users shall be restricted. There is no value specified for this tag. Refer to Section 2.6.1.3, "Number and Name Display Including Privacy" for Openscape Voice-specific name and number privacy handling.

Table 4 Supported SFR Tags *(Sheet 1 of 2)*

Field Name	Supported	Options
ond	Y	Indicates the sequence of dialable characters used to reach a One Number Service Device (OND) associated with the user's ONS-published number (represented in the Directory Number field). For ONS DeviceIDs, the OND represents the actual device used by the ONS user (and shall be a private number), whereby the Directory Number field represents the user's published number, which is the number exposed to its call partners. The OND is supported in the same formats as the Directory Number field. **Note:** OND is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (refer to Appendix F, "One Number Service (ONS)" for further details).
appCallbackID	Y	Indicates the number that the called party can use to reach the caller. This number may be different that the Directory Number of the DeviceID. The number should be specified in international or global number notation. This tag is supported in the Make Call service request and reported in subsequent events.
appCallbackName	Y	Indicates the name that shall be presented to the other parties in the call. This name may be different that the Name Field associated with of the DeviceID. This tag is supported in the Make Call service request and reported in subsequent events.
exclude	Y	The exclude tag was implemented for a specific Microsoft Office Communicator (MOC) implementation for multiple contacts. If the tag value is moc (exclude=moc) in the Make Call or Answer call service then OpenScape Voice shall not be considered the registered MOC as an associated device for the Make Call or Answer Call request.
keyID	Y	The keyID tag appears in connectionIDs where shared keyset lines are in use. The keyID tag contains the deviceID of a device currently using an appearance of the primary DN. The keyID tag ensures that connectionIDs are unique during conference (bridge) and transfers.
uid	Y	The uid tag appears in the connectionID when the calling or called device is external to OSV. The uid tag ensures that connectionIDs are unique during conference (bridge) and transfers.

Table 4 Supported SFR Tags *(Sheet 2 of 2)*

Examples of SFR formatted deviceIDs:

```
N<+1(408)492-2343>John
Smith;ond=+14085551212;displayNumber=22343
```

```
N<+1(408)492-2343>;ond=+14085551212;displayNumber=22343
N<+1(408)492-2343>;prNum
N<+1(408)492-2343>;appCallbackID=+1(408)492-
2000;appCallbackName=Accounting Dept
```

2.6.1.2 Global Number Format

- Global Number Format (GNF) supports both the DD and SFR (DN) device ID formats.
- GNF is identified by a leading plus (“+”) and not other formatting characters.
- GNF impacts all supported services, service responses and events.
- Applications service requests using GNF deviceID format are identified internally within OpenScape Voice as international numbers. If GNF deviceID format is not used by the applications the provided number is treated as an “unknown” type within OpenScape Voice. Unknown numbers are assumed to be dialable for the purposes of routing or the service ID of an internal subscriber or subscriber extension.
- OpenScape Voice supports GNF format in non-call-related services.

2.6.1.3 Number and Name Display Including Privacy

1. OpenScape Voice currentlydoes not support deviceID name (prNam) and number (prNum) privacy tags defined in the SFR format section. Refer also to Switching Function Representation (SFR).
2. OpenScape Voice supports several privacy subscriber features that will block name and number information. Privacy applies to subscriber DNs and Group Devices (MLHG Pilot) DNs.
   - Privacy features may be applied to calling and called number presentation in either the DD or SFR formats.
   - Privacy features may be applied to calling and called number and name presentation independently when using the SFR format. For example, number presentation may be blocked and only the name presented.
3. The following privacy presentation are applied to the device identifiers for the following scenarios:
   - Subscriber Number Privacy = “Restricted”. Applies to DD or SFR (DN field and displayNumber tag).
   - Subscriber Name Privacy = blank. Applies to SFR name portion of NM field. All other tags follow normal presentation rules. Example of deviceID with blank name: N<+498972249995>; displayNumber=49995.

- External Number Privacy (Out-of-area or Private) = “Restricted” “. Applies to DD or SFR (DN field and displayNumber tag). Out-of-Area applies for inter-BG and gateway calls. Privacy applies when number blocking services are applied.
- External Name Privacy (Out-of-Area or Private) = “Not Known”. Applies to name portion of NM field only. All other tags follow normal presentation rules. Out-of-Area applies for inter-BG and gateway calls. Privacy applies when number blocking services are applied.

4. Group Device (MLHG) number display considerations:
   - For calls to an MLHG pilot number the CSTA events reported to the caller will provide the number display info of the MLHG pilot for the agent device. If the MLHG pilot has subscriber number privacy set, the display info associated with the agent device will also be “restricted”. If the MLHG pilot does not have privacy set, the display info associated with the agent device will be the display info that is associated with the pilot.
   - For calls to an MLHG pilot number, the CSTA events reported to parties other than the caller (i.e. the pilot or the agent) will provide the display info of the agent for the agent device, and this display info will reflect the privacy settings for the agent.
5. CSTA supports sending party’s identities in the CSTA events. The party’s GNF or fully qualified private number will be used as device identifier. Refer to sections 2.6.1.2 and 3.2.8 for addional details.
6. CSTA also reports, via the displayNumber name field tag, the formatted display information for the parties reported in the events, except for the reporting device itself. The display information contains the name and the ‘dialable’ display number as created via the OpenScape Voice Display Number Modification tables.
7. The display information is optional for CSTA Conferenced Events and subsequent events for the Conferenced connections (i.e. Failed, Held, and Retrieved).
8. OpenScape Voice call processing has a restriction where the phone displays are not updated for External calls. However, for CSTA, the OpenScape Voice does report the normal CSTA events with updated display information for the life of the call.
9. OpenScape Voice has implemented an exception to the “Restricted” deviceID for conferencingDevice. This deviceID is always presented. It is the applications responsibility to restrict presentation of this parameter.

CSTA Number and Name Privacy Presentation Rules

Display	Internal / External	CSTA deviceID privacy	Example deviceID format
Number	Internal *	The device identifier status is presented as “restricted” and the displayNumber tag is omitted.	N<restricted>Jim Smith
	External	Same as internal.	N<restricted>Boca
Name	Internal	The name portion of the deviceID is empty (blank).	N<+498972249995>; displayNumber=49995
	External (BG)	The name portion of the deviceID is as provided by gateway or the provisioned BG name is provided.	N<+15615551212>Boca; displayNumber=81561555 1212
	External (E.164)	The name portion of the deviceID is empty (blank). *OPEN: Verify with development if “Not Know” is used as described in the CSTA Interface Specification.*	N<+15615551212>; displayNumber=81561555 1212
***** Case 1; For calls to an MLHG pilot number, the CSTA events reported to the caller provide the number display info of the MLHG pilot for the agent device. If the MLHG pilot has subscriber number privacy set, the display info associated with the agent device is also “restricted”. If the MLHG pilot does not have privacy set, the display info associated with the agent device is the display info that is associated with the pilot. Case 2: For calls to an MLHG pilot number, the CSTA events reported to parties other than the caller that is the pilot or the agent provide the display info of the agent for the agent device, and this display info reflects the privacy settings for the agent.			

Suggested rules for CSTA application number display in UI:

- Always display the information in the displayNumber tag, if present.
- If displayNumber tag is not present and deviceID is not “restricted” then the deviceID number may be presented.
- If the deviceID number is restricted then application should provide language specific or language neutral information that indicates that the number is “Private”.
- If an OND tag is presented it should NEVER be presented as a display number to the user.

Note: One Number Service Device (OND) is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (refer to Appendix F, “One Number Service (ONS)” for further details).

Suggested rules for CSTA application name display:

- If the application does not support a directory name lookup by number function then the application should always display the information provided in the name field of the deviceID.
- If the application does support a name lookup function by number and the deviceID is not “restricted” then the name may be display as it appears in the directory. However, if no entry is found in the directory then the name field of the deviceID should be displayed.

2.6.1.4 Multibyte Support for Name (NM) Field in UTF-8 Encoding

OpenScape Voice supports multibyte characters primarily for the Chinese market. With this multibyte implementation, OpenScape Voice potentially can support other foreign languages in the future. The multibyte support is limited to DisplayName and BusinessGroupLineName sent to SIP endpoints and CSTA-enabled applications.

Only selected subscribers’ data visible to the phone and CSTA application users is in UNICODE. Subscribers’ Chinese display-name needed by SIP endpoints or CSTA applications is provided. All system administrative data such as Business Group and Class Of Service etc. and all provisioning needed to make the system work remain as it is today.

When subscriber device names are provisioned for UNICODE format CSTA sends out calling party display names in the Delivered and Established events in UTF-8 encoding.

Since CSTA events are formatted in UTF-8 encoded XML, any character with a value exceeding 127 (in addition to some characters used in the XML syntax) is currently represented in an escaped sequence. Since a UTF-8 encoded character string could conflict with this escaping mechanism, the entire name string is now expected in UTF-8 encoded format and the escaping mechanism is no longer be applied, except to XML syntax specific characters such as ‘<’, ‘>’, ‘/’, and so on.

2.6.2 Negative Service Response

The following service response error codes are supported by OpenScape Voice. The “x” mark in an error code column indicates that the error code is possible.

	Operation Errors														All Other Errors								
Error Values -> **CSTA Service**	**generic**	**invalidDevicID**	**invalidCallID**	**privellegeViolationSpecificDevice**	**privellegeViolationSpecificDevice**	**InvalidMonitorObject**	**invalidMonitorCrossRefId**	**requestIncompatibleWithMedia**	**requestIncompatibleWithDevice**	**requestIncompatibleWithMedia ActiveConnection**	**serviceNotSupported**	**InvalidDestination**	**InvalidForwardingDestination**	**invalidForwardingType**	**generic "category"**	**deviceOutOfService**	**invalidConnectionState**	**resourceBusy**	**requestedProtocolVersionNotSupported**	**noSessionIDAvailable**	**serverResourcesBusy**	**maxNumberSessions**	**invalidSessionID**
CAPABILITIES EXCHANGE SERVICES																							
get CSTA features	x														x								
get logical device Information	x	x		x											x								
get switching function capabilities	x														x								
SYSTEM SERVICES																							
system register	x														x								
request system status	x														x								
system status	x														x								
MONITORING SERVICES																							
monitor start	x	x													x	x							
monitor stop	x														x								
SNAPSHOT SERVICES																							
snapshot call	x	x	x	x																			
snapshot device	x	x										x			x	x							
snapshot devicedata	x	x													x								

Table 5 Supported Negative Service Responses

	Operation Errors														All Other Errors								
Error Values -> **CSTA Service**	**generic**	**invalidDevicID**	**invalidCallID**	**privellegeViolationSpecificDevice**	**privellegeViolationSpecificDevice**	**InvalidMonitorObject**	**invalidMonitorCrossRefId**	**requestIncompatibleWithMedia**	**requestIncompatibleWithDevice**	**requestIncompatibleWithMedia ActiveConnection**	**serviceNotSupported**	**InvalidDestination**	**InvalidForwardingDestination**	**invalidForwardingType**	**generic "category"**	**deviceOutOfService**	**invalidConnectionState**	**resourceBusy**	**requestedProtocolVersionNotSupported**	**noSessionIDAvailable**	**serverResourcesBusy**	**maxNumberSessions**	**invalidSessionID**
APPLICATION SESSION SERVICES																							
abort application session																							x
reset application session timer																							x
start application session																			x	x	x	x	x
stop application session																							x
CALL CONTROL																							
accept call																							
alternate call	x		x												x								
answer call	x		x												x								
call back call-related	x	x		x				x	x														
clear connection	x	x	x												x								
conference call	x		x												x								
consultation call	x		x												x								
deflect call (target is alerting or offered party)	x		x							x	x	x											
directed pickup call	x	x	x	x											x	x	x						
group pickup call	x	x		x											x	x	x						

Table 5 Supported Negative Service Responses

	Operation Errors														All Other Errors								
Error Values -> **CSTA Service**	**generic**	**invalidDevicID**	**invalidCallID**	**privellegeViolationSpecificDevice**	**privellegeViolationSpecificDevice**	**InvalidMonitorObject**	**invalidMonitorCrossRefId**	**requestIncompatibleWithMedia**	**requestIncompatibleWithDevice**	**requestIncompatibleWithMedia ActiveConnection**	**serviceNotSupported**	**InvalidDestination**	**InvalidForwardingDestination**	**invalidForwardingType**	**generic "category"**	**deviceOutOfService**	**invalidConnectionState**	**resourceBusy**	**requestedProtocolVersionNotSupported**	**noSessionIDAvailable**	**serverResourcesBusy**	**maxNumberSessions**	**invalidSessionID**
hold call	x		x												x								
make call	x	x										x			x	x							
reconnect call	x		x												x								
retrieve call (from hold)	x		x												x								
single step transfer	x	x	x									x			x								
transfer call	x		x												x								
CALL ASSOCIATED FEATURES																							
change connection information	x		x				x								x								
generate digits	x		x												x								
PHYSICAL DEVICE FEATURES																							
get message waiting indicator	x	x													x	x							
get microphone mute	x	x		x			x								x			x					
get speaker volume	x	x		x			x								x			x					
set microphone mute	x	x		x			x								x			x					
set speaker volume	x	x		x			x								x			x					
LOGICAL DEVICE FEATURES																							

Table 5 Supported Negative Service Responses

	Operation Errors														All Other Errors								
Error Values -> **CSTA Service**	**generic**	**invalidDevicID**	**invalidCallID**	**privellegeViolationSpecificDevice**	**privellegeViolationSpecificDevice**	**InvalidMonitorObject**	**invalidMonitorCrossRefId**	**requestIncompatibleWithMedia**	**requestIncompatibleWithDevice**	**requestIncompatibleWithMedia ActiveConnection**	**serviceNotSupported**	**InvalidDestination**	**InvalidForwardingDestination**	**invalidForwardingType**	**generic "category"**	**deviceOutOfService**	**invalidConnectionState**	**resourceBusy**	**requestedProtocolVersionNotSupported**	**noSessionIDAvailable**	**serverResourcesBusy**	**maxNumberSessions**	**invalidSessionID**
call back non-call-related	x	x		x				x	x						x								
get agent state	x	x													x								
get do not disturb	x	x		x				x							x								
get forwarding	x	x		x										x	x			x					
set agent state	x	x													x								
set do not disturb	x	x		x											x			x					
set forwarding	x	x		x									x	x	x			x					

Table 5 Supported Negative Service Responses

Note: The negative acknowledgement error codes sent by the computing domain are application specific and is ignored by OpenScape Voice. An entry in the error log is generated.

2.6.3 Dynamic Feature Presentation (using servicesPermitted)

2.6.3.1 General

OpenScape Voice makes every effort to provide accurate dynamic feature presentation data however 100% accuracy of the servicesPermitted parameter is not guaranteed.

Support with servicesPermitted is restricted to indicating CSTA Call Control and CSTA Snapshot services. Support on events is limited to CSTA Call Control and CSTA Call Associated events.

Figure 4 shows how servicesPermitted parameter is determined by OpenScape Voice. The inverse pyramid represents all possible CSTA services defined by ECMA 269. The bands within the pyramid represent from top to bottom items A-D are considered mostly static services permitted and E-F mostly dynamic services permitted.

- CSTA services currently supported by OpenScape Voice are listed in the CSTA Interface Specification. These are all possible statically available services.
- With the possible exception of OpenScape Voice customers, subscriber features may be purchased A la Carte by the provider or provisioned as part of a profile. Some feature provisioning statically available CSTA services. For example, a Business Connection must purchase CSTA, ONS, Forwarding, MLHGs, and so on. The CSTA interface specification identifies the OpenScape Voice features that affect CSTA services. Refer also to Section 3.2.1, “BGL Services Affecting CSTA Services”.
- OpenScape Voice providers may resell services to their customers which may affect available CSTA services.
- Subscriber, including OpenScape Voice, may enable or disable certain features which may affect available CSTA services.
- During the course of a call only certain CSTA services are permitted depending on the event, connection state and possibly the cause.
- Even in a specific call state, certain restrictions comes about because of other conditions, for example, number of calls at a device, and so on. These can be applied as special rules after obtaining the basic rule based on event, connection state and cause.

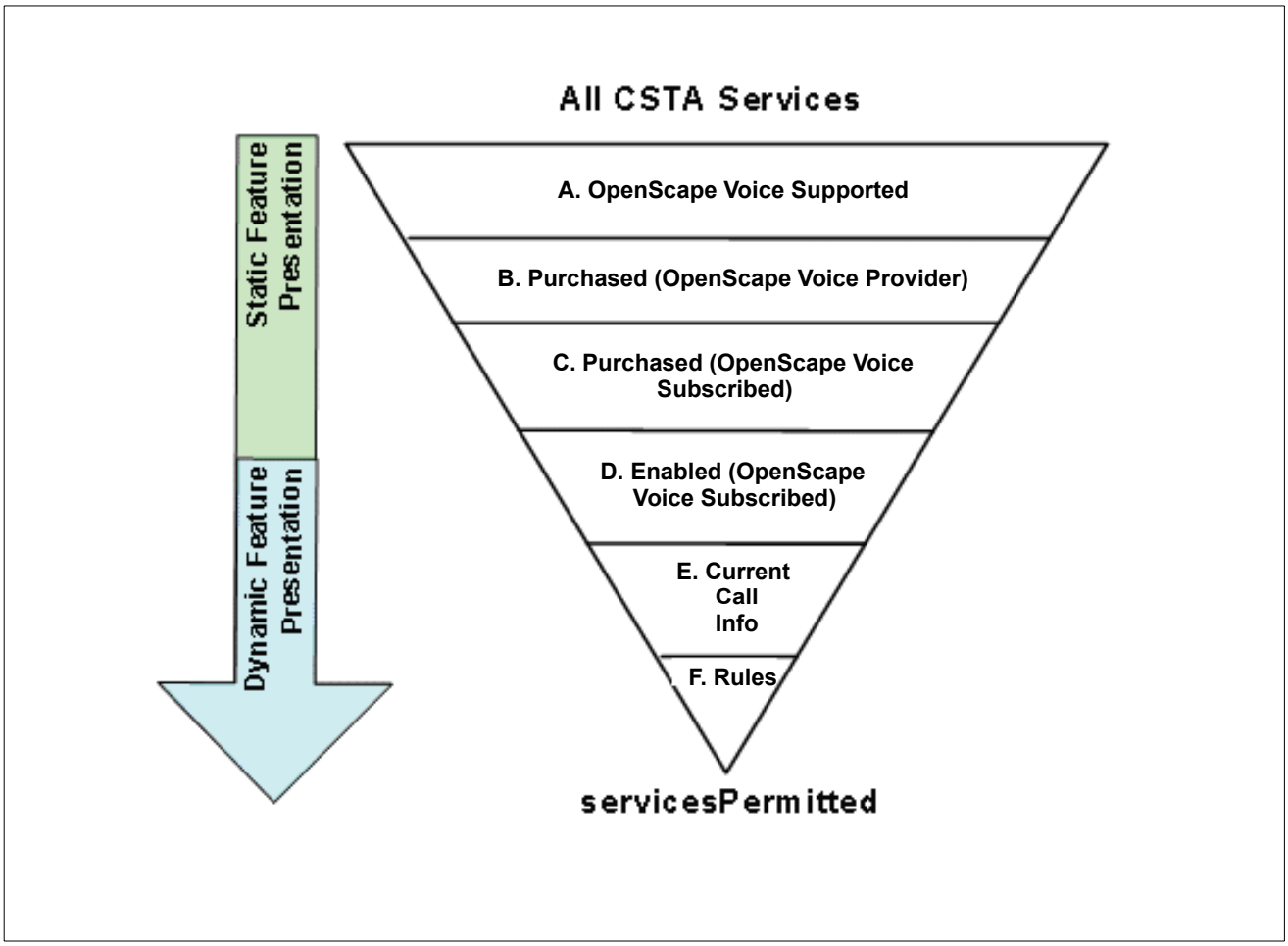


Figure 4 servicesPermitted Inverse Pyramid

Layers A through F are combined to create the set of services that can be executed upon a call in a given call state. To be available to a user, a feature must be permissible in each of the layers.

Within layers B, C and D, purchased and enabled features have an effect on the static feature presentation, and thus later on the dynamic aspect of the services permitted.

Within layer E is affected by device type where service is invoked (Table 6).

2.6.3.2 Device Type Considerations

CSTA Service → **Standard CSTA by Device Type**	**Accept Call**	**Alternate Call**	**Answer Call**	**Call Back Call-Related**	**Clear Connection**	**Conference Call**	**Consultation Call**	**Deflect Call**	**Hold Call**	**Reconnect Call**	**Retrieve Call**	**SS Transfer Call**	**Transfer Call**	**Change Conn. info**	**Generate Digits**	**Make Call**
Normal	✓			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
SimenesType1 Phone / Client	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CSTA over SIP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MLHG Pilot (Group Device)					✓			✓								

Table 6 servicesPermitted by Device Type

2.6.3.3 Call State Considerations

Deeper within **layer E**, the state of the connection affects the servicesPermitted in a dynamic manner. Table 7 servicesPermitted by Connection State provides a list of currently supported events and the servicesPermitted presentation. The table bases servicesPermitted presentation on the local connection state of the device receiving the event. In considering the services permitted, the event cause may also need to be considered when determining the feature availability. This table only represents the basic results as further rules is used to modify what the application sees.

CSTA Service → **Connection State**	**Accept Call**	**Alternate Call**	**Answer Call**	**Call Back Call-Related**	**Clear Connection**	**Conference Call**	**Consultation Call**	**Deflect Call**	**Hold Call**	**Reconnect Call**	**Retrieve Call**	**SS Transfer Call**	**Transfer Call**	**Change Conn. info**	**Generate Digits**	**Make Call**
Alert – offering	**Yes**	N[2]	N[2]	**Yes**	**Yes**	N[1]	N[1]	**Yes**	N[1]	N[2]	N[1]	N[2]	N[1]	N[1]	N[2]	N[2]

Table 7 servicesPermitted by Connection State (Sheet 1 of 2)

Connection State	Accept Call	Alternate Call	Answer Call	Call Back Call-Related	Clear Connection	Conference Call	Consultation Call	Deflect Call	Hold Call	Reconnect Call	Retrieve Call	SS Transfer Call	Transfer Call	Change Conn. info	Generate Digits	Make Call
Alert – ringing	N[1]	**Yes**	**Yes**	**Yes**	**Yes**	N[1]	N[1]	**Yes**	N[1]	**Yes**	N[1]	N[2]	N[1]	N[1]	N[2]	N[2]
Alert – entering distribution	N[1]	N[2]	N[2]	N[2]	N[2]	N[1]	N[1]	N[2]	N[1]	N[2]	N[1]	N[2]	N[1]	N[1]	N[2]	N[2]
Connected	N[1]	**Yes**	N[1]	N[1]	**Yes**	**Yes**	**Yes**	N[2]	**Yes**	**Yes**	N[1]	**Yes**	**Yes**	**Yes**	**Yes**	N[2]
Failed	N[1]	N[1]	N[1]	**Yes**	**Yes**	N[1]	N[1]	N[2]	N[1]	N[2]	N[1]	N[2]	N[1]	N[1]	N[2]	N[2]
Hold	N[1]	**Yes**	N[1]	N[1]	**Yes**	**Yes**	N[1]	N[2]	N[1]	**Yes**	**Yes**	N[2]	**Yes**	**Yes**	N[2]	N[2]
CSTA Service →																
Initiated	N[1]	N[1]	N[2]	N[1]	**Yes**	N[1]	N[1]	N[1]	N[1]	**Yes**	N[1]	N[1]	N[1]	N[1]	N[2]	N[2]
Null	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	N[1]	**Yes**
Queued	N[1]	N[2]	N[2]	N[2]	**Yes**	N[1]	N[1]	**Yes**	N[1]	N[2]	N[1]	N[2]	N[1]	N[1]	N[2]	N[2]

Yes = Permitted by CSTA and OpenScape Voice
N[1] = Not permitted by CSTA
N[2] = Not permitted by OpenScape Voice

Table 7 servicesPermitted by Connection State (Sheet 2 of 2)

2.6.3.4 Situational Considerations

The final layer of the inverse pyramid, **layer F**, represents as set of exception rules which are used to clarify the final services permitted value. Some of the key conditions are as follows:

- CSTA permits a **Make Call** when the device can support a new Null or Initiated call. It does just depend upon the current connection state of the device per se, but the ability of the device to support multiple calls in that state.
- Reconnect requires that one connection be in Hold state and there is more than one call on the device else the service is not permitted.

- **Alternate** requires that one connection be in Connected state else the service is not permitted.
- **Transfer** requires both a connection in Hold state and a call in Connected state else the service is not permitted. The device cannot be part of a conference else the service is not permitted.
- **Conference** requires both a connection in Hold state and Connected state else the service is not permitted.
- **Change Connection Information** requires an established state for one party, which means at least one party is in connected state and the other is in Connected or Held state.
- **Single Step Transfer** requires **only one call** be present for the device in Connected state else the service is not permitted. The service is also not permitted if the device is part of a conference (TWC or Large).
- **Generate Digits** requires a call in a connected state that is, not part of a conference.
- The only service allowed in connected state before an established event is received is **Clear Connection** or **Reconnect Call**. From the A side the Originated and Delivered are both sent in the connected state.
- If the current call leg is part of a Large Conference (SIP), the only allowed services are Consultation, Hold, Retrieve, Reconnect, Alternate, ClearConnection and Conference. This call never digresses back to a basic call.
- **Consultation Call** will be presented on the active call. If the physical device supports uaCSTA, then a consultation call will be presented when there are two call legs active. If there are multiple calls at an AoR with multiple contacts (see Section 3.2.7, “Multiple Contacts (SIP Forking)”), then consultation is possible on only one callID.
- **Retrieve** does not work for non-uaCSTA devices unless the device was put on hold using the application.
- **Answer Call** is not allowed if multiple contacts are registered on the called device.
- **Call Back Call-Related** service is not presented in A-side Delivered Event if the cause code is:

  a) ENTERING_DISTRIBUTION

  b) RECALL

  c) RECALLBUSY

  d) RECALLFORWARDED

  e) RECALLNOANSWER

f) CALLBACK or

g) SINGLESTEPTRANSFER

2.6.3.5 Static Condition Considerations

- **Answer Call** does not work unless the subscriber is provisioned as SiemensType1 or CSTA over SIP.
- **Alternate Call** will be presented but will not work if the autoReconnect feature is not configured on the Siemens Enterprise Communications phone.
- **Call waiting** in the phone is required for initial consultation, hold, and conferencing.
- **Conference Call** will be presented if the subscriber is provisioned with service. However, the registering SIP device must have Large Conference configured.

2.6.3.6 Service Permitted Usage Notes

The servicesPermitted parameter type is a list of bitmaps where each bit represents a service that can be applied to a connection. When a bit is set, the corresponding service is permitted. The following is the list of bitmaps (multiple bits may be set in this parameter):

- Call control services - the call control services supported by OpenScape Voice.
- Call associated services - the call associated services supported by OpenScape Voice.
- This parameter indicates which of a subset of CSTA services are permitted.
- When the servicesPermitted parameter is provided in an event, it applies to the connection at the monitored device. This may or may not be the same as the subject device.
- If there are multiple connections at a device, the information reported in the servicesPermitted parameter may not accurately reflect all possible service restrictions and interactions between multiple connections at a device.
- There may be situations in a switching function that cause a service to fail after being presented as permitted in the servicesPermitted parameter. This may be due to dynamic system and/or resource conditions that may cause service availability restrictions. The switching function shall provide the appropriate error code in the negative acknowledgement to the failed service request.

Note that all of the above give a good general view of what services permitted values can be expected under certain conditions. However, the CSTA application should make no assumptions based upon this information. The key point is for the application to be switch-type agnostic and use the actual servicesPermitted to determine what services can and cannot be issued at any given point in time.

2.7 OpenScape Voice Feature Interaction with CSTA and ONS

CSTA call control event flows are subject to interactions with other OpenScape Voice features. The services provided by CSTA and One Number Service (ONS) are included in the OpenScape Voice Feature Interaction Matrix (available in eDoku). The OpenScape Voice Feature Interaction Matrix provides feature-by-feature interactions for CSTA and ONS.

Note: One Number Service (ONS) is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (for further details please refer to Appendix F, “One Number Service (ONS)”).

---

3 Administration and Management Considerations for CSTA

This section describes aspects of OpenScape Voice administration and Siemens Enterprise Communications SIP phone configuration prerequisites to properly enable the CSTA services. Detailed administration and maintenance of OpenScape Voice, SIP phones and associated CSTA applications are described in the associated administration user and training documentation for each product.

3.1 Application Connectivity

3.1.1 OpenScape Voice—CSTA over TCP Connections

Application connectivity is managed using the CLI interface, which administers the CSTA protocol data associated with the CSTA Signaling Manager (SM).

- Maximum CSTA Application Sessions (1-256, default = 64)
- Maximum Monitored Endpoints (1 – 1 million, Supported = 150,000, default = 100,000)
- CSTA Manager Virtual IP 1 (1.x.x.x - 255.x.x.x, where each “x” is an integer within the range 0 - 255. default = 0.0.0.0). Address used to establish TCP transport by CSTA application with the first CSTA SM instance.
- CSTA Manager Virtual IP 2 (1.x.x.x - 255.x.x.x, where each “x” is an integer within the range 0 - 255. default = 0.0.0.0). Address used to establish TCP transport by CSTA application with the second CSTA SM instance.
- Connect Port (1025 – 32000, default 1040). CSTA SM listening port.

Refer to Section 4.3.1.2, “Monitor Start” for a statement on maximum number of active monitors per connection.

Note: It is highly recommended that no more than 10,000 monitors be started per TCP connection.

Refer to *OpenScape Voice Config and Admin Using App-Level Management* for your installation for specific management requirements.

3.1.2 OpenScape Voice—Co-located Cluster

In a co-location arrangement, there are two CSTA IP addresses on the OpenScape Voice cluster (one on node 1 and one on node 2) that can be used in parallel. These two IP addresses are virtual (in the co-location scenario), so that when node 1 is out of service, both IP addresses are active on node 2. Similarly, when node 2 is out of service, both IP addresses are active on node 1.

3.1.3 OpenScape Voice—Geo/Network Separated Cluster

In the case of geo/network separation; the OpenScape Voice node 1 TCP IP address cannot move to node 2 because node 2 is in a different IP subnet. Instead, a second IP address is defined on node 2 that also offers CSTA of TCP communication with OpenScape Voice. This IP is always active and both IPs (node 1 and node 2) can be used in parallel by the application.

3.2 Subscriber Management Configuration (OpenScape Voice Assistant) or Expert Mode using CLI

3.2.1 BGL Services Affecting CSTA Services

Table 8 identifies some typical subscriber services that affect CSTA services.

Subscriber Service	Comments
Automatic Recall	Needed for recall flows
Call Forward Busy	Get / Set Forwarding
Call Forward No Answer	Get / Set Forwarding
Do Not Disturb	Get / Set DND for subscriber device
Call Forward Remote Activation	Call Forward Remote Activation
Call Forward Variable	Forwarding
Call Forward Voice Mail	Single Step Transfer to Voice mailbox
Call Hold	Hold and Retrieve Call
Call Pickup Group	Call Pickup Group
Call Transfer	Consultation and compound call services
Call Waiting	Consultation and compound call services
Caller ID	Number Presentation services
CSTA	Enabler for all CSTA Services
ONS Inbound and Outbound	Enabler for ONS
Large Conference Service	Conference

Table 8 Relationship of OpenScape Voice Subscriber Services to CSTA Services

3.2.2 BGL with Registering or Non-Registering SIP Device

- CSTA Service must be active
- CSTA device capability category must be selected. Section 2.4, “Supported CSTA Services and Events (by Device Type)” describes how each device category listed below affects CSTA services:
  - Normal – for any SIP device
  - SiemensType1 – for OptiPoint and OptiClient
  - CSTA over SIP – for OpenStage

- Provision SIP endpoint data. This is required whether a device registers for the BGL or not.
- It is recommended that Call Forward – Dependable be provisioned in the event a call is delivered to a currently unregistered SIP device.

3.2.2.1 SiemensType1 and CSTA over SIP Device Type configuration

The following table identifies SIP phone/client configuration data required to support some CSTA services.

CSTA Service	Siemens Type1	CSTA over SIP	SIP Endpoint Configuration*	Comments
Agent State – Ready / Not Ready	Yes	Yes	Configure Hunt Make Busy feature toggle key on device.	Required for phone to provide the user interface for Agent State Ready / Not Ready indication.
Alternate Call	Yes	Yes	Auto reconnect = On	
Answer Call	Yes	Yes	Auto Answer=On	
Consultation Call	Yes	Yes	Auto Answer=On	
Conference	Yes	Yes	Auto Reconnect = On	To add a party to an existing conference.
Get / Set Call Forwarding	No	Yes	Centralized Feature Support = On Enable uaCSTA = On	Phone requires support of OpenScape Voice centralized Forwarding using uaCSTA.
Get / Set DND	No	Yes	Centralized Feature Support = On Enable uaCSTA = On	Phone requires support of OpenScape Voice centralized DND services using uaCSTA.
Get Microphone Mute	No	Yes	Enable uaCSTA=On	
Get Speaker volume	No	Yes	Enable uaCSTA=On	
MakeCall (hands free)	Yes	Yes	Auto answer = On	
Reconnect	Yes	Yes	Auto Answer = On Auto Reconnect = On	
Retrieve	Yes	Yes	Auto Answer = On Auto Reconnect = On	
Set Microphone Mute	No	Yes	Enable uaCSTA=On	
Set Speaker volume	No	Yes	Enable uaCSTA=On	
* Refer to OpenScape *Voice V5, Configuration, Administrator Documentation,* for information about configuring OptiPoint and OpenStage telephones.				

3.2.3 MLHG Pilot (Group Device / ACD) and Agent BGLs

Hunt Groups are used by applications to temporarily queue calls for distribution to available agents.

Refer to Appendix E, “MLHG and CSTA Capabilities” for a description of Hunt Group attributes and how these maybe used by CSTA-enabled applications.

Figure 5 illustrates an example of application configuration in a hosted environment to monitor and control hunt group call distribution.

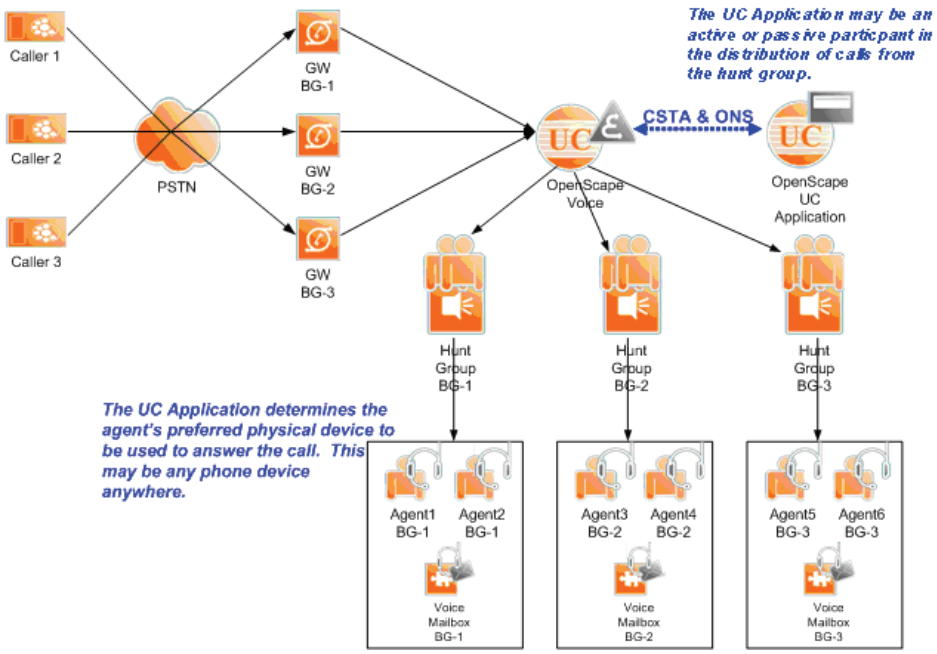


Figure 5 *Example: OpenScape Voice Hunt Group and OpenScape UC Application*

3.2.4 One Number Services (ONS) / ONS Subscribers

Attention: This section is for Siemens Enterprise Communications internal use only. Refer to Appendix F, “One Number Service (ONS)” for futher details.

ONS is provisioned under the User Mobility Services category. OpenScape Voice One Number Service requires CSTA subscriber service provisioning.

- **One Number Service - Inbound and Outbound (ONS-IO)**

  ONS-IO is a OpenScape Voice mobility service that enables CSTA and ONS aware applications to route, track, and control inbound and outbound calls using existing CSTA OpenScape Voice call control services for any device located anywhere.

3.2.5 SIP Multiple Contact Registration and Feature Interaction

OpenScape Voice supports multiple SIP contacts registration for the same address of record. Thus SIP messages sent to the address of record from the system are forked to multiple devices.

To prevent conflicts with feature interactions OpenScape Voice restricts service initiation by multiple contacts to only the SIP contact ID already active on a call.

Refer to individual CSTA services for operational notes regarding interaction with multiple contacts.

3.2.6 Multiple Appearance (Keyset Operation)

While a keyset device may be provisioned for CSTA services, the CSTA interface does not provide a keyset model. All services are provided for the keysets prime line.

OpenScape Voice does not currently support a full keyset model as defined by ECMA-269 Annex A. However, OpenScape Voice does provide the following functionality for devices configured as keysets:

- A monitored DN (prime line or Address of Record) that appears as a line appearance (non-prime line) on another device is selected (reserved), CSTA flows a Services Initiated for the monitored DN. The initiatingDevice parameter is set to the prime line of the device where the line is reserved or in-use.
- CSTA provides normal event flows for any monitored DN used in a keyset arrangement.
- CSTA call control and associated call control services are blocked while a monitored DN is in-use as a secondary appearance on another device. All service requests are rejected.
- A privateData tag named “keyOperation” is included in call control events presented on the primary line indicating that the primary line device is not involved in the call. Applications should use this information to appropriately manage call control user interface associated with the user’s primary line.
- CSTA non-call related CSTA services are supported while a monitored DN is in-use as a secondary appearance on another device.
- DeviceID format for subscriber DNs configured as Keysets with Line or Device based operation the following presentation rules apply:
  - **Line Based Keyset Operation**

    The DN field and the displayNumber parameter of the SFR deviceID are the same number (that is, the line in use).
  - **Device Based Keyset Operation**

    When an originating call is answered, the DN is the line in use; the displayNumber is the display number of the device in use. Otherwise the DN and the displayNumber portion of the SFR are the same number (that is, the line used).

    For terminating calls to device based line appearances on a keyset device, the called device is the line that is called and the displayNumber is the display number for that line. Upon answer of the call by a device based line appearance, the called device is the line that answered, but the displayNumber is the display number for the device upon which the line appears.

Exception: If the CISNUM service is not enabled at the caller's device, or if the caller is in another BG, such that called party display information is not presented to the phone, CSTA attempts to provide display information using NDAL API. In this special case, the displayNumber is always the display number for the line that was called.

3.2.7 Multiple Contacts (SIP Forking)

CSTA monitors a provisioned subscriber's address of record (AoR). If multiple bindings are in a call independently, each binding will be treated as a separate call. CSTA maintains no association between two calls at the AoR. The uniqueness of each binding is maintained via the UCE context-id of the call (callID), IP Address and Port associated with the binding.

CSTA Services that act on a call shall use the call-id associated with the call to invoke services. This will result in only the particular binding being acted upon for a specific CSTA Service. In the case of a CSTA Consult Service Request, the CSTA Manager will ensure that the associated device used for initiating the A-side of the consultation leg will be the one that is already in a call identified in the Consult Service Request connection-id parameter. The other bindings will not be considered for consultation service request.

The CSTA Service and CSTA Manager shall ensure that only one Back in Service and only one Out of Service event is sent to the CSTA applications per DN.

3.2.8 Global Number Format (GNF) Replacement -- RTP Parameter

The GNFPrefixReplacement RTP parameter and Prefix Access Code (PAC) table must be correctly provisioned to ensure proper translation of deviceIDs sent by an application in Global Number Format. Any service requests sent by the application with GNF in any portion of a deviceID (including OND) is rejected with an InvalidDestination error code.

GNFPrefixReplacement—Unique prefix access code string of up to 15 characters (allowed: 0-9, *, #). CSTA SM replaces the '+' sign with this unique prefix access code string and the resulting number is translated as NoA = 'unknown'. The administrator must provide the correct entries in the Prefix Access Code (PAC) table to support the translation of the unique prefix access code to breakout to a common numbering plan of the Destination Code Table.

OSV number translation now supports "+" in the number plan table. The GNFPrefixReplacement will be automatically set to allow GNF in CSTA service request as a default.

3.3 Failure and Restart Considerations

3.3.1 Simplex OpenScape Voice System

If the CSTA service is restarted for any reason TCP link is dropped and must be reestablished by the application. Active monitors is stopped unless they are started under an application session as defined in Section 4.5, “Application Session Services”.

System status events provide information relating to restart and recover. Refer to Section 4.2.2.2, “System Status”for services provided in the event of a restart of the CSTA service.

3.3.2 Duplex OpenScape Voice System (co-located)

Same as Simplex except that after node switch over the CSTA TCP IP address is maintained and migrated to the backup OpenScape Voice node.

3.3.3 Duplex OpenScape Voice System (geo/network separated)

Section 3.1.3, “OpenScape Voice—Geo/Network Separated Cluster”, on page 48 describes how CSTA TCP IP addresses are handled this configuration.

3.3.3.1 CSTA Application using Cold Stand-By Operation

An instance of a CSTA application is deployed in each subnet. One CSTA application is configured in OpenScape Voice and used during normal operation. The other CSTA application is a cold standby application. Once, the server of the configured CSTA application is out of order, OpenScape Voice is reconfigured to use the server with the cold standby CSTA application.

CSTA applications connect to the CSTA signaling manager using a single IP address. Today this IP address floats from the primary node to the secondary node upon node failure, forcing all traffic through the fiber-link.This requires manual invocation of cold stand-by application server.

3.3.3.2 CSTA Application using Hot Stand by Operation

OpenScape Voice also supports DNS. Ideally, CSTA applications should also support the DNS SRV record and actually look for a live CSTA signaling manager in a list of IP addresses provided. However, if this is an option that application may consider. If a hot standby capability is not possible due to time/effort then a cold stand-by should be used.

3.4 ECMA 354 Application Session Services

It is highly recommended that applications support ECMA 354 Application Session Services. Application Session Services enable OpenScape Voice and the application to preserve established device monitors for a negotiated period of time.

Application session services also provide a mechanism to detect application heartbeat failure for MLHG backup call distribution.

Refer to Section 4.5, “Application Session Services” for service details.

3.5 Call Admission Control (CAC) Subscriber Re-routing

OpenScape Voice supports subscriber re-routing over the PSTN in case with Resource Management failure or WAN/MAN failure. As a result of subscriber re-routing CSTA call flows are need to be understood by the application. Detailed CAC Resource Management and WAN failure call flows are defined in Appendix A, “CSTA Call Scenarios”.

4 OpenScape Voice CSTA Service Description

Global Service Description Statements:

- Supported negative service response error values are described in Section 2.6.2, “Negative Service Response”.
- Unless otherwise specified the OpenScape Voice operational model should not differ from related ECMA specification.

4.1 Capabilities Exchange

4.1.1 Services

4.1.1.1 Get CSTA Features

The Get CSTA Features service obtains the list of CSTA services and events supported by the switching function.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Parameters

No required parameters.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Parameter Name	Supported	Comments
supportedServices	Y	Specifies the list of CSTA services supported by the switching function. Each entry in the bitmap represents supported services.
supportedEvents	Y	Specifies the list of CSTA events supported by the switching function. Each entry in the bitmap represents a supported event.

OpenScape Voice Operational Notes

- This service provides a static view of services and events defined in Section 2.4, “Supported CSTA Services and Events (by Device Type)”.

- Rules for dynamic feature presentation refer to Section 2.6.2, “Negative Service Response”.

4.1.1.2 Get Logical Device Information

The Get Logical Device Information service is used to obtain the current set of characteristics / capabilities associated with the logical element of a given device.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Parameters

Parameter Name	Content	Supported	Comments
device	DeviceID	Y	Specifies the device being queried.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Parameter Name	Supported	Comments
deviceCategory	Y	Specifies the device category (station, ACD device, and so on) of the device in the service request. Supported values: • Station (Default) – Any subscriber DN • Group (Hunt) when deviceID is OpenScape Voice MLHG Pilot DN.
groupDeviceAttributes	Y	Specifies the group device attributes of the device being queried. Bitmap values supported is: • Hunt - when deviceCategory is set to “Group”
hasPhysicalElement	Y	Specifies if the device has a physical element associated with this device identifier. • FALSE - The device does not have a physical element (for example, Group device) • TRUE - The device does have a physical element.
acdModels	Y	Specifies the type of ACD Model(s) that are present at this device. If a bit is TRUE, then the specified model is supported. The following is the list of bits (multiple bits may be set): • Visible ACD-related Devices - FALSE • Non-Visible ACD-related Devices - FALSE OpenScape Voice always sets both to zero (false) since OpenScape Voice does not support ACD devices.

Parameter Name	Supported	Comments
appearanceAddressable	Y	Specifies whether the appearances of the logical element are addressable (using the Call Appearance “CA” string or the physical element extension “EXT” string in the Switching Function Representation Device Identifier format). This is Sent when device is a keyset. The only supported value is: • FALSE - Keyset appearances are not addressable.
appearanceType	Y	Specifies the type of appearances associated with the logical element. Supported value(s): • Selected-Standard
appearanceList	Y	Specifies the list of device identifiers that are available at the logical element. The parameter is mandatory if the appearances are addressable and if it is Selected Standard or Basic Standard Type. OpenScape Voice usage for MLHG pilot is non-standard for Group deviceCategory: • When the logical device is an MLHG Pilot DN a list contains the member devices provisioned in the MLHG. This list only contain appearances DNs that can be observed and/or controlled within the OpenScape Voice domain.
associatedGroupList	Y	This parameter specifies the list of device identifiers for all the other devices which are members of this group deviceID. This optional list shall only contain devices within the switching sub-domain that may be either observed and / or controlled within the switching subdomain. The following conditions are supported: • When logical device ID is an agent (member of MLHG) then this list contains the MLHG Pilots the agent is associated with.
mediaClassSupport	Y	Specifies the media class of calls that the device can support. Support values: • Voice • Image • IM Refer to Section 4.1.1.3, “Get Switching Function Capabilities” for services and events that support media characteristics.
logDevServList	Y	Specifies a list of capability bitmap parameter types corresponding to categories of services. Each bitmap entry in the lists represents a service that applies to a logical device that is supported by the device. This includes but is not limited to the following categories of services: • callControlServList • callAssociatedServList • CallAssociatedServList logicalServList Refer to Appendix C, “Supported CSTA Services and Events by Device Type” for supported CSTA services by device type.

Parameter Name	Supported	Comments
logDevEvtsList	Y	Specifies a list of capability bitmap parameter types corresponding to categories of events. Each bitmap entry in the lists represents an event that applies to a logical device that is supported by the device. This includes but is not limited to the following categories of events: • callControlEvtsList • callAssociatedEvtsList • logicalEvtsList Refer to Appendix C, "Supported CSTA Services and Events by Device Type" for supported CSTA events.
deviceMaintEvtsList	Y	Specifies a list of bitmaps. Each bitmap entry represents a device maintenance event that is supported by the device. Supported values: • Back in Service • Out of Service
maxDevicesInConf	Y	Specifies the maximum number of devices both within and outside the switching function that this device may conference into a call. The minimum value that can be supplied for this value is 3. • If device uses Large Conference services this value range is 3-48 members.
transAndConfSetup	Y	Specifies the different ways that this device can set up for a conference and/or transfer. OpenScape Voice supports: • Consultation Call
privateData	Y	This services returns the following private data elements: • device with the possible values: – SIP – MGCP – MLHGPILOT **Note:** This parameter is not provided for other device types. • busGroupID with the following: – Business Group ID **Note:** This parameter is not provided if subscriber is not member of BG. • timeZoneLocation - Default is "Local" meaning switch time zone. Refer to OpenScape Voice Assistant for supported time zone values.

OpenScape Voice Operational Notes

None

4.1.1.3 Get Switching Function Capabilities

The Get Switching Function Capabilities service is used by the computing function to obtain the current set of capabilities for the entire switching function.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Options

No required parameters.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Parameter Name	Support	Comments
switchingSubDomainName	Y	Specifies the name of switching sub-domain which distinguishes it from other switching sub-domains. Currently supported values: • OpenScape Voice (Enterprise)
manufacturerName	Y	Specifies the name of the manufacturer of the switching sub-domain. Currently supported value(s): • Siemens COM
profiles	Y	Specifies the CSTA Profiles supported by the switching function. Currently supported profiles: • basicTelephonyProfile
deviceIDFormat	Y	Specifies the types of device ID formats supported by the switching function in service requests. If a bit is TRUE, then the specified format is used by the switching function. In addition to dialable digits 0-9, the following is the list of the possible formats (multiple bits may be set): • Asterisk “*” • Hash “#” • SF Representation format - “NM” SF Representation format – Generic **Note:** Some additional formats may be reported as true but are not officially supported.

Parameter Name	Support	Comments
swdomainFeature	Y	Specifies which features are supported by the switching function. Supported values: • Forward – isForwardingBefore • Forward Default – swFunctionDefaultSettings • Forward Default – userSpecific • Connection Failure – Neg. Ack. • Connection Failure – supportFailedWithAssConn • Other – External Calls Incoming Calls • Other – External Calls Outgoing Calls • Other – recall • Other – callBack • Other – prompting
swAppearanceAddressability	N	Specifies what types of appearance addressability is available within the switching sub-domain.
swAppearanceType	Y	Specifies what types of appearances are available within the switching sub-domain All values are set to False.
ignoreUnsupportedParameters	Y	Specifies how the switching function handles unsupported optional parameters in service requests. Supported values: • Ignore parameters - This indicates that the switching function treats unsupported optional parameters as if they were not present.
mediaClassSupport	Y	Specifies the media class of calls that the device can support. Supported values: • Voice • Image • IM

<table>
<tr><th>Parameter Name</th><th>Support</th><th>Comments</th></tr>
<tr><td>callCharacteristicsSupported</td><td>Y</td><td>Specifies the characteristics that the switching function sends in CSTA events:

Parameter — Supported
acdCall — Y
lowPriorityCall — N
priorityCall — Y
highPriorityCall — Y
maintenanceCall — N
directAgent — Y*
assistCall — N
voiceUnitCall — N
privateCall — N
personalCall — N
sensitiveCall — Y
confidentialCall — N
encryptedCall — Y**

Note: OpenScape Voice does not support callCharacteristics parameter in service requests. The following callCharacteristics are provided in Call Control and Call Associated Feature events.</td></tr>
<tr><td>privateDataFormat</td><td>Y</td><td>Specifies the format(s) of the privateData information supported by the switching function. Supported value:
• octetStringFormSF

Note: This parameter is not sent. However, privateData is supported in some services and events as indicated in the subsequent sections.</td></tr>
<tr><td>dynamicFeatureSupported</td><td>Y</td><td>Specifies how the switching function provides the servicesPermitted parameter on events. Supported value:
All – for all supported events.

Note: This parameter is not sent. However, OpenScape Voice does support and provide dynamic feature presentation as described throughout this specification.</td></tr>
<tr><td>deviceOnDeviceMonitorFilter</td><td>Y</td><td>Specifies the complete monitorFilter parameter that is supported by the switching function when the monitorObject is a device and the monitorType is a device. Supported values:
• Callcontrol - Filter is supported for each supported call control event in Section 2.3.3, “Application Link Security Considerations”.
• Logical device - Filter is supported for each supported call control event in Section 4.11, “Logical Device Feature Services”.</td></tr>
</table>

Parameter Name	Support	Comments
connectionView	Y	Specifies the meaning of the primary and secondary old call parameters in the Conferenced and Transferred events. Supported values: • local view
maxLengthParameters	Y	Each value is the switching function's maximum length (in octets/ characters) for the corresponding parameters and parameter types. The computing function should not send larger data or the service request is rejected. The following list provides the different parameters and parameter types for which a maximum value is provided. The number in parenthesis specifies the maximum possible length. Supported parameters (max. length) • agentID (32) • callID in the ConnectionID (16) • CSTAPrivateData parameter type: (128) • Device Identifiers (128) • userData(256) • charactersToSend parameter: (32) If any of the above values is zero, then the parameter or parameter type is not supported.
servEvtsList	Y	Specifies a list of capability bitmap parameter types corresponding to categories of services. This list corresponds to those services and events listed in Section 2.4, "Supported CSTA Services and Events (by Device Type)". Supported parameters: • capExchangeServList • systemStatServList • monitoringServList • snapshotServList • callControlServList • callControlEvtsList • callAssociatedServList • callAssociatedEvtsList • logicalServList • logicalEvtsList • deviceMaintEvtsList If a list entry is not included in the list, then the corresponding category of services/events is not supported by the switching function.
* The description of this callCharacteristic was modified in ECMA 269 Edition 7. The value "DirectAgent" is used to indicate a direct call that over-rides the destination re-direction settings for example DSS operations. ** This is a new callCharacteristic defined in ECMA 269 Edition 7.		

OpenScape Voice Operational Notes

None

4.1.1.4 Get Physical Device Information

Service Not Supported

The Get Physical Device Information service is used to obtain the current set of characteristics / capabilities associated with the physical element of a given device.

Note: OpenStage devices support some physical device capabilities such as, volume and mute control. Refer to Section 4.10, “Physical Device Features” for details.

4.1.1.5 Get Switching Function Devices

The Get Switching Function Devices service is used by the computing function to obtain the current set of devices in the application working domain along with their associated device categories and associated device names.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Options

Parameter Name	Supported	Comments
requestedDeviceID	Y	Specifies the device identifier of the device being queried. If the device ID is not provided then a list of all supported device category.
requestedDeviceCategory	Y	Specifies that only devices of the requested category be provided. Supported category: • Group (Hunt) – for MLHG Pilots

Service Response Parameters

This service follows the multi-step acknowledgement model for this service request.

Positive Acknowledgment

The positive acknowledgement for the Get Switching Function Devices service indicates that one or more Switching Function Devices services will subsequently be generated by the switching function.

Parameter Name	Supported	Comments
serviceCrossRefID	Y	Specifies the correlator used to associate subsequent Switching Function Devices services to this service request.

OpenScape Voice Operational Note

Only MLHG Pilots or Pilot Master DNs are supported.

4.1.1.6 Switching Function Devices

The Switching Function Devices service is used by the switching function to provide a list of devices in the application working domain. This service is generated as a result of the Get Switching Function Devices service.

The switching function may generate a sequence of Switching Function Devices services, individually referred to as segments, in response to a single Get Switching Function Devices service request.

Acknowledgement Model

There is no positive acknowledgement. This is sent as a result of Get Switching Function Devices service request.

Service Request Parameters

Parameter Name	Supported	Comments
serviceCrossRefID	Y	Specifies the cross reference used to associate the Switching Function Devices service request to the Get Switching Function Devices service request.
segmentID	Y	Specifies the segment number of this message. Each successive segment number in the sequence increments the segmentID by one.
lastSegment	Y	Specifies (True / False) if this segment is the last one associated with the serviceCrossRefID.
deviceList	Y	Specifies the list of device Identifiers representing the devices that can be controlled and/or observed. Supported parameters: • deviceID – specifies device ID for the device category

Service Response Parameters

There is no service request completion conditions associated with this service

Positive Acknowledgement

There are no positive acknowledgements associated with this service request.

OpenScape Voice Operational Note

Only Group Device (MLHG) pilot DN is returned by this service. It is possible that a station deviceID is reported when used as the master pilot of the MLHG.

4.2 System Services

4.2.1 Registration Services

4.2.1.1 Change System Status Filter

Service Not Supported

The Change System Status Filter service is used by the computing function to change the filter options for a current system registration.

4.2.1.2 System Register

The System Register service is used by the computing function to register to receive system services from the switching function.

The computing function may be required to register for system services before it can receive any system service requests from the switching function.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Parameters

Parameter Name	Supported	Comments
requestTypes	Y	Specifies the system services that are being registered. Supported parameters: • System Status²
requestedStatusFilter	Y	Specifies the requested set of System Status Types to be filtered (not sent) by the switching function. OpenScape Voice does not support status filtering and responds with actualStatusFilter accordingly.

Service Response Parameters

This service follows the atomic acknowledgement model for this service request.

Positive Acknowledgment

Parameter Name	Supported	Comments
sysStatRegisterID	Y	Specifies the system registration identifier for this registration.
actualStatusFilter	Y	Specifies the actual set of System Status Types that is filtered (not sent) by the switching function. OpenScape Voice responds with all statuses. No filtering is provided.

OpenScape Voice Operational Notes

- Only one system registration is supported per TCP link / Application Session. Subsequent System Register requests is negatively acknowledged.
- The registration ID is no longer valid if the TCP link fails or connectivity adaptor is restarted.

4.2.1.3 System Status Register Abort

Service Not Supported

The System Register Abort service is used by the switching function to asynchronously cancel an active system registration. This service invalidates a current systems status registration.

4.2.1.4 System Status Register Cancel

Service Not Supported

The System Register Cancel service is used to cancel a previous system registration. This request terminates the system registration and the computing function receives no further system service requests for that system registration once it receives the positive acknowledgement to the System Register Cancel request.

4.2.2 Services

4.2.2.1 Request System Status

The Request System Status service is used by the computing function to obtain (that is, query) the system status of its peer function.

Service Request Parameters

Parameter Name	Supported	Comments
sysStatRegisterID	Y	Specifies the system registration identifier for this registration.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Response Parameters

This service follows the atomic acknowledgement model for this service request.

Positive Acknowledgement

Parameter Name	Supported	Comments	
systemStatus	Y	Specifies the status of the function issuing the service request.	
		Status	**Supported**
		• Initializing • Enabled • Messages Lost • Disabled • Partially Disabled • Overload Imminent • Overload Reached • Overload Relieved	Yes Yes No (Future) Yes No (Future) No (Future) Yes Yes

OpenScape Voice Operational Notes

None

4.2.2.2 System Status

The System Status service is used by the computing function or switching function to report its system status to its peer function. The indicated status may or may not have changed since the last System Status request was issued. This service can also be used to implement a heartbeat mechanism between the two

functions. This service is bidirectional. The table below only reflects the OpenScape Voice system status event implementation. System status bidirectional scenarios are described in the following:

Table 4-1 - System Status Service from OpenScape Voice to Application

Table 4-2 - System Status Service from Application to OpenScape Voice

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Request Parameters

Parameter Name	Supported	Comments	
sysStatRegisterID	Y	Specifies the system registration identifier associated with the system registration for this request.	
systemStatus	Y	Specifies the status of the function issuing the service request.	
		Status	**Supported**
		• Initializing • Enabled • Messages Lost • Disabled • Partially Disabled • Overload Imminent • Overload Reached • Overload Relieved	Yes Yes No (Future) Yes Yes No (Future) Yes Yes
monitorObjectList	C	Parameter sent when systemStatus = Messages Lost. The list contains all monitor	

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

OpenScape Voice Operational Notes

- OpenScape Voice sends a System Status service immediately after an application establishes a TCP connection. The connected application send a System Status response within 20 seconds or OpenScape Voice will drop the TCP connection.
- System Status messages are sent after the System Register service request is received or after a System Status request from the computing function when used as a heartbeat mechanism.
- Currently OpenScape Voice does not provide a mechanism to enable periodic system status using systemStatusTimer in Get Switching Function Capabilities positive acknowledgement.

- A system status of partially disabled ocurrs when geographically separated OpenScape Voice nodes are running in standalone mode.
- The following tables describe reasons for system status services requests.

OpenScape Voice -> Application or Application Platform		
systemStatus cause value	**Reasons or meanings for this status event**	**Expected Reaction**
Messages Lost	• OpenScape Voice detected that a CSTA event may have been lost during internal processing. • OpenScape Voice is restarting. In this case, service request messages are rejected until the OpenScape Voice link is re-established.	The application or application platform should take the necessary recovery actions to keep its databases updated while facing the prospect that at least one CSTA event may have been lost.
Partially Disabled	• OpenScape Voice geographically separated node is running in standalone mode. • In this mode some registering devices may be unavailable (out-of-service) until nomal operation is re-established.	The application should be aware that some devices may be out-of-service in this node.
Disabled	• OpenScape Voice is shutting down, restarting or reloading. It is very possible that the “Disabled” event may not reach the application. • The CSTA service has been administratively disabled on OpenScape Voice.	The application should assume that OpenScape Voice is in a “not ready state and discontinue any further service requests until OpenScape Voice has signaled that it has again entered the ready state. **NOTES:** The Ready state is signaled by a subsequent System Status event with the Enabled cause value. • While in the Disabled state no service request is acknowledged by OpenScape Voice. • All active monitors are cleared and should be considered lost by the application. • If OpenScape Voice is shutting down the Enabled system status is not sent until OpenScape Voice has been restarted. • If OpenScape Voice is performing a restart it could take several minutes for the Enabled system status to be sent.

OpenScape Voice -> Application or Application Platform		
systemStatus cause value	**Reasons or meanings for this status event**	**Expected Reaction**
Enabled	• OpenScape Voice is ready • OpenScape Voice CSTA service has been administratively re-activated and ready for service requests from the application.	Begin sending service requests. Monitors are cleared. **Note:** If OpenScape Voice did not send an Initializing system status prior to the Enabled event then all previously established monitors remain valid.
Initializing	OpenScape Voice CSTA service is restarting and all monitors are no longer valid. OpenScape Voice always sends 1 mandatory Initialization system status prior to an application registration.	Same expectations as the Disabled system status.
Overload reached	OpenScape Voice is declaring that an overload condition has been reached.	When OpenScape Voice sends the systemStatus with the overloadReach cause value the application is blocked from sending new MakeCall, ConsultationCall and SingleStepTransfer service requests. This condition remains until OpenScape Voice sends the System Status = overloadRelieved.
Overload relieved	The previously declared Overload Reached condition has been relieved.	Return to normal processing and begin sending service requests.
Normal	Response to application status (that is, Loopback). Maybe used to provide a heartbeat. However, currently no periodic heartbeat is provided by OpenScape Voice.	If capable the application must positively acknowledge the system status event.

System Status message are sent after the application registration is received using the requestTypes System Status and maybe used by the application as a heartbeat mechanism.

Note: Currently OpenScape Voice does not provide a mechanism to enable periodic system status using systemStatusTimer in Get Switching Function Capabilities positive acknowledgement.

Application or Application Platform –> OpenScape Voice		
systemStatus cause value	**Reasons or meanings for this status event**	**Expected Reaction**
Enabled	Typically all active monitors have been cleared.	OpenScape Voice assumes that the application has cleared all active monitors if Application Session Service timer has expired or no application session has been started.
Normal	Response to application status (that is, Loopback) Maybe used to provide a heartbeat. However, currently no periodic heartbeat is expected by OpenScape Voice.	If capable, OpenScape Voice positively acknowledges the system status event.

4.2.2.3 Switching Function Capabilities Changed

Service Not Supported

The Switching Function Capabilities Changed service is used to indicate that switching function level capability information available using the Get Switching Function Capability service has changed.

4.2.2.4 Switching Function Device Changed

Service Not Supported

The Switching Function Devices Changed service is used to indicate that information associated with the current set of devices that can be controlled and observed in the switching subdomain has changed.

4.3 Monitoring Service

4.3.1 Services

4.3.1.1 Change Monitor Filter

The Change Monitor Filter service is used to modify the set of event reports that are filtered out (not sent) over an existing monitor. The new set events to be reported are listed in the service acknowledgement.

Service Request Parameters

Parameter Name	Supported	Comments
crossRefIdentifier	Y	This parameter indicates the monitor for which to change the filter.
requestedFilterList	Y	This parameter specifies the requested set of events to be filtered out (not sent) by the server. Refer to Appendix C, “Supported CSTA Services and Events by Device Type” for supported CSTA events.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Positive Acknowledgement

Parameter Name	Supported	Comments
actualFilterList	Y	This parameter specifies the requested set of events to be filtered out (not sent) by the server. The actual events filtered may be different from the requested filter. If the actual and requested filters are the same this parameter is not be sent in the positive response. Refer to Section 2.4 for supported CSTA events.

OpenScape Voice Operational Notes

None

4.3.1.2 Monitor Start

The Monitor Start service initiates event reports (otherwise known as events) for a device.

OpenScape Voice does not support call monitoring.

Service Request Parameters

Parameter Name	Supported	Comments
monitorObject	Y	Specifies the monitor object of a device to be monitored. Supported option: • Device (Device ID)
requestedMonitorFilter	Y	This parameter specifies the requested set of events to be filtered out (not sent) by the switching function. It is a bitmap of all events defined in this Standard. Refer to Appendix C, "Supported CSTA Services and Events by Device Type" for supported CSTA events supported by the monitorFilter.
monitorType	Y	Specifies the type of monitor requested. Supported options: • device-type (default if not provided)
requestMonitorMediaClass	N	Specifies the media classes (voice, digital data, Email, message, etc.) of calls that are being requested to be monitored for the monitorObject.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Positive Acknowledgement

Parameter Name	Supported	Comments
crossRefIdentifier	Y	This is a value that is unique within the association for the duration of the monitor and that can be used to relate subsequent events to the monitor request that initiated them. This parameter also allows correlating Monitor Stop and subsequent Change Monitor Filter services with the original Monitor Start service on which they act.
actualMonitorFilter	Y	This parameter specifies the actual set of events to be filtered out (not sent) by the switching function. It is a bitmap of all events defined in this Standard. Refer to Section 2.4 for supported CSTA events supported by the monitorFilter.
actualMonitorMediaClass	N	This parameter specifies the actual media classes of calls that are monitored by the switching function for this monitor.
monitorExistingCalls	N	Indicates whether or not the computing function receives events reports regarding calls that re currently existing at the device at which the monitor was started.
privateData	Y	Indicates whether or not the computing function will receive events reports regarding calls that re currently existing at the device at which the monitor was started. **NOTE:** OpenScape Voice provides events by default for existing calls.

OpenScape Voice Operational Notes

- The monitorObject must be a deviceID.
- OpenScape Voice supports only device monitoring. If the call leaves the monitored device the monitoring can’t be continued.
- OpenScape Voice does not currently limit the number of device monitors per TCP link or Application Session.

  Note: It is highly recommended that no more than 10,000 device monitors be started per TCP link or Application Session.

- Monitoring is only guaranteed for devices within the switching sub domain.
- Multiple monitors may exist for the same station device or group device. Each monitor may have a unique event filter.
- Multiple applications monitoring and controlling the same device are responsible for coordinating any call control functions to avoid conflicts among the applications.

- Group Devices (MLHG) may be monitored and provide backup call distribution (UCD mode) for applications that use Application Session Services.
- Monitoring of ONS provisioned SIP deviceID is supported regardless of whether a physical device is registered for that deviceID.

4.3.1.3 Monitor Stop

The Monitor Stop service is used to cancel a previously initiated Monitor Start service.

The Monitor Stop service can be issued by a function to terminate or signal the termination of a corresponding Monitor Start service.

Service Request Parameters

Parameter Name	Supported	Comments
crossRefIdentifier	Y	This specifies which monitor to cancel.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2.

Service Response Parameters

This service follows the atomic acknowledgement model for this request.

Positive Acknowledgement

A positive acknowledgement to the service request indicates that the Cross Reference ID provided in the Monitor Start response is no longer invalid.

OpenScape Voice Operational Note

The switching function may issue a Monitor Stop service when it can no longer provide information, for example if device is deleted through administration.

4.4 Snapshot Services

4.4.1 Services

4.4.1.1 Snapshot Call

The Snapshot Call service provides information about the devices participating in a specified call. The information provided includes device identifiers, their connections in the call, and local connection states of the devices in the call as well as call related information. Information that applies to the entire call is provided in the Snapshot Call positive response. Information that is specific to each endpoint in the call (snapshotData parameter) is provided in the Snapshot Call positive acknowledgement Dynamic Feature Availability is supported and provided in the servicesPermitted parameter.

Service Request Parameters

Parameter Name	Supported	Comments
snapshotObject	Y	Indicates the connection ID of the call to be snapshot. ECMA also provides the option for CallID only for this parameter; however this option is not supported by OpenScape Voice.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Positive Acknowledgement

<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Comments</th></tr>
<tr><td>serviceCrossRefID</td><td>Y</td><td>Specifies the reference used to associate subsequent Snapshot CallData services to this service request. OpenScape Voice does not support Snapshot Call Data service.</td></tr>
<tr><td>snapshotData</td><td>Y</td><td>Specifies information for each endpoint in a call. Supported parameters for snapshotDeviceResponseInfo:
<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Type</th></tr>
<tr><td>connectionIdentifier</td><td>Y</td><td>connectionID</td></tr>
<tr><td>deviceID</td><td>Y</td><td>deviceID</td></tr>
<tr><td>localCallState</td><td>Y</td><td>choiceStructure
OpenScape Voice supports compoundCallState
<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Type</th></tr>
<tr><td>compoundCallState</td><td>Y</td><td>localConnectionState</td></tr>
</table></td></tr>
<tr><td>mediaCallCharacteristics</td><td>Y</td><td>Supported values:
• Voice
• Image
• IM</td></tr>
<tr><td>servicesPermitted</td><td>Y</td><td>Specifies a list of the call control services that can be applied to the local connection.</td></tr>
<tr><td>ConnectionInformation: flowDirection</td><td></td><td>Supported flowDirection:
• Transmit&Receive
• Receive (silent monitoring active)</td></tr>
</table></td></tr>
<tr><td>callingDevice</td><td>Y</td><td>Specifies the calling device.</td></tr>
<tr><td>calledDevice</td><td>Y</td><td>Specifies the called device</td></tr>
<tr><td>associatedCallingDevice</td><td>Y</td><td>Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. Supported options:
Always “notKnown”
Not provided for outgoing calls.</td></tr>
<tr><td>associatedCalledDevice</td><td>Y</td><td>For outgoing external calls, this parameter specifies the Network Interface Device associated with the originally called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. Not provided for incoming calls.</td></tr>
</table>

OpenScape Voice Operational Notes

- The snapshotObject connectionID must contain a valid call ID and a valid device ID. *ECMA also provides the option for CallID only for this parameter; however this option is not supported by OpenScape Voice.*
- If any of the partner devices are not provisioned with CSTA the servicesPermitted is omitted and the localConnectionInfo becomes “unknown”.
- OpenScape Voice does not currently store any display information so no displayNumber or name information is returned in the Snapshot Call Response.

- The servicesPermitted parameter returned in the response may not be fully accurate due to the limitation of information kept internally in OpenScape Voice. Applications should resynchronize their servicesPermitted knowledge on subsequent events is generated for the call.

4.4.1.2 Snapshot Device

The Snapshot Device service provides information about calls associated with a given device. The information provided identifies each call that the device is participating in and the local connection state of the device in that call. This service also provides a mechanism to cleanup any so-called “ghost calls”.

Service Request Parameters

Parameter Name	Supported	Comments
SnapshotObject	Y	The Device ID is the directory number of the snapshot device.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Service Response Parameters

<table>
<tr><th>Parameter Name</th><th>Supported</th><th colspan="4">Comments</th></tr>
<tr><td>serviceCrossRefID</td><td>Y</td><td colspan="4">Specifies the reference used to associate subsequent Snapshot CallData services to this service request.</td></tr>
<tr><td rowspan="9">snapshotData</td><td rowspan="9">Y</td><td colspan="4">Specifies information for each endpoint in a call. Supported parameters for snapshotDeviceResponseInfo:</td></tr>
<tr><td>Parameter Name</td><td>Supported</td><td colspan="2">Type</td></tr>
<tr><td>connectionIdentifier</td><td>Y</td><td colspan="2">connectionID</td></tr>
<tr><td>deviceID</td><td>Y</td><td colspan="2">deviceID</td></tr>
<tr><td>localCallState</td><td>Y</td><td colspan="2">choiceStructure
OpenScape Voice supports compoundCallState</td></tr>
<tr><td></td><td></td><td>Parameter Name</td><td>Supported</td><td>Type</td></tr>
<tr><td></td><td></td><td>compoundCallState</td><td>Y</td><td>localConnectionState</td></tr>
<tr><td>mediaCallCharacteristics</td><td>Y</td><td colspan="2">Supported values:
Voice
Image
IM</td></tr>
<tr><td>servicesPermitted</td><td>Y</td><td colspan="2">Specifies a list of the call control services that can be applied to the local connection.</td></tr>
</table>

OpenScape Voice Operational Notes

- This service does not affect the call state at the specified device.
- This service reports available for the prime line of a keyset device only.
- If there are <= 32 calls on a device, the response to SnapshotDevice returns the information about all of those calls. If there are > 32 calls on a device, the response to SnapshotDevice returns a cross reference ID and the information about the calls are returned in one or more SnapshotDeviceData messages (32 calls per message).
- localCallState provides simpleCallState view:

  If for example, A consults C with B on hold, the Snapshot calls would return as follows:

  A = 2 calls, hold(1st call), connected(2nd call)
  B = 1 call, connected
  C = 1 call, connected
- Service is only supported for keyset device prime line.
- All active connections known by CSTA are reported immediately. After the acknowledgement, CSTA performs an asynchronous verification on each connection to determine if these connections that are still invalid (i.e., so called ghost-calls). Invalid connections are cleared by CSTA.

4.4.1.3 Snapshot CallData

Service Not Supported

This service is generated as a result of the Snapshot Call service. It is used when the switching function is providing snapshot call information in multiple messages (otherwise the switching function provides the snapshot call information in the Snapshot Call positive acknowledgement).

4.4.1.4 Snapshot DeviceData

This service is generated as a result of the Snapshot Device service. It is used when the switching function is providing snapshot device response information in multiple messages (otherwise the switching function provides the snapshot device response in the Snapshot Device positive acknowledgement).

This includes information about calls associated with a given device. The information provided identifies each call the device is participating in and the local connection state of the device in that call. The switching function may generate a sequence of Snapshot DeviceData services, individually referred to as segments, in response to a single Snapshot Device service request.

Service Request Parameters

<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Comments</th></tr>
<tr><td>serviceCrossRefID</td><td>Y</td><td>Specifies the reference used to associate the Snapshot DeviceData service messages to the Snapshot Device service request.</td></tr>
<tr><td>segmentID</td><td>Y</td><td rowspan="2">Specifies the segment number of this message. Each successive segment number in the sequence increments the segmentID by one.
Specifies (True / False) if this segment is the last one associated with the serviceCrossRefID.</td></tr>
<tr><td>lastSegment</td><td>Y</td></tr>
<tr><td>snapShotData</td><td>Y</td><td>
<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Type</th></tr>
<tr><td>connection Identifier</td><td>Y</td><td>connectionID</td></tr>
<tr><td>deviceID</td><td>Y</td><td>deviceID</td></tr>
<tr><td>localCallState</td><td>Y</td><td>choiceStructure
OpenScape Voice supports compoundCallState
<table>
<tr><th>Parameter Name</th><th>Supported</th><th>Type</th></tr>
<tr><td>compointCallState</td><td>Y</td><td>localConnectionState</td></tr>
</table></td></tr>
<tr><td>mediaCallCharateristics</td><td>Y</td><td>Supported values:
Voice
Image
IM</td></tr>
<tr><td>servicesPermitted</td><td>Y</td><td>Specifies a list of the call control services that can be applied to this local connection</td></tr>
</table>
</td></tr>
</table>

Service Response Parameters

There is no service request completion conditions associated with this service.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

OpenScape Voice Operational Notes

See Snapshot Device notes.

4.5 Application Session Services

Applications are not required to implement Application Session Services to use CSTA services.

Applications Session Services (refer to Section 1.4, “References”) establish and maintain a relationship between an application and a server for the purpose of exchanging application messages. For the purpose of this Standard this relationship is called an application session.

Session IDs provide mechanisms for:

- OpenScape Voice and Application to preserve and recover device monitor cross-reference ID after a link failure.
- Enables Group Device (MLHG) under application control to provide backup call distribution (UCD) based on the application heartbeat extension.
- Enables applications to declare exclusive call control for a Group Device (MLHG).

OpenScape Voice supports the following Application Session Services as defined by ECMA 354. Both HPPC application (A) and OpenScape Voice server (S) must comply with all conformance requirements defined in section 2 of ECMA 354 for:

- Start Application Session (A → S)
- Stop Application Session (A → S)
- Reset Application Session Timer (A → S)
- Application Session Terminated (A ← S)

The following are known limitations in OpenScape Voice implementation of Application Session Services:

- OpenScape Voice supports only one Application Session per CSTA TCP connection. A second Start Application Session Service request on a CSTA TCP connection is rejected.
- System Status messages related to an Application Session are not supported.
- Request System Status messages should not be exchanged for application heartbeat purposes when using an Application Session. Application heartbeat for the purposes of backup call distribution from a Group Device (Hunt) is a FUTURE requirement.

4.5.1 Start Application Session

The Start Application Session service is used to initiate an application session between an application and a server.

A globally unique identifier, called a sessionID, is returned in the positive service response that identifies the application session.

Once an application session is established, the server must maintain information associated with the application session. When the application session is terminated, the application context information is cleared.

The application session exists until:

- It is stopped by using a Stop Application Session service
- The session is abnormally terminated by the server as indicated by the Application Session Terminated service (for example, due to the session timer expiry)

Service Request Parameters

Parameter Name	Supported	Comments
applicationInfo	Y	Specifies information associated with the application requesting the application session. Supported parameters: • applicationID • applicationSpecificInfo
requestedProtocolVersions	Y	Specifies one or more application protocol versions that the application wants to use for the application association. The list is ordered by highest priority protocol version first. • ECMA-323 (Edition 4)
requestedSessionDuration	Y	Specifies the length of time (in seconds) that the application session should be maintained. The sessionDuration timer can be periodically refreshed using the Reset Application Session Timer service. If the requestedSessionDuration is not provided the server chooses a default sessionDuration value. Refer to usage notes for session duration negation rules.
extensions	Y	Specifies non-standardized information. OpenScape Voice supports an application heartbeat timer negotiation which can be used to trigger backup call distribution at a monitored group device (MLHG). Supported options: • requestedHBT value n (see usage notes)

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in the service response definition below.

Positive Acknowledgement

Parameter Name	Supported	Comments
sessionID	Y	Specifies the globally unique identifier associated with the application session that has been created.
actualProtocolVersion	Y	Specifies the protocol version that is being used for the application session. This protocol version shall be one of the protocol versions specified in the service request. OpenScape Voice does not currently support protocol negotiation and accepts requestedProtocolVersion as shown below. Any mismatch in namespace and installed release is rejected. • ECMA-323 Edition 4
actualSessionDuration	Y	Specifies the new value for the length of time (in seconds) that the application session is maintained by the server. This value may be less than or equal to the requestedSessionDuration in the service request. If the requestedSessionDuration is not provided in the service request, the server provides a default value which shall be used for the application session. See usage notes for session duration negation rules.
extensions	Y	Specifies non-standardized information. OpenScape Voice supports an application heartbeat timer negotiation which can be used to trigger backup call distribution at a monitored group device (MLHG). Supported options: • actualHBT value n (see usage notes)

Negative Acknowledgement

Parameter Name	Supported	Comments
errorCode	Y	Specifies the type of error. Either a standardized error or an application specific error may be used. The standardized set of errors are: • invalidApplicationInfo – the server is unable to establish an application session due to invalid or unrecognized information in the applicationInfo parameter. • requestedProtocolVersionNotSupported – none of the requested protocol versions specified in the service request are supported. • serverResourcesBusy – the server cannot establish an application session due to internal resource constraints. • maxNumberSessions – the server cannot create an application session because it has reached the maximum number of allowed application sessions (or example, license/provisioning limitations).
extensions	Y	Specifies non-standardized information.

OpenScape Voice Operational Notes

None

4.5.1.1 Basic Application Session (Monitor Recovery)

- The applicationInfo information provided by the application is only logged by OpenScape Voice. No other usage of this information defined for this information.
- Currently Application Session Services have a one-to-one relationship with the application and virtual TCP address provisioned for CSTA service access (Refer to Section 3.1, “Application Connectivity”).
- Application Session XML namespace ECMA 354 was added to all Application Session Services. For the requestedProtocolVersion and actualProtocolVersion, the OpenScape Voice switching function only uses the protocolVersion in the request/response messages exchanged with the application. Therefore, it is required that the applications list the Application Session XML namespace as their first namespace in the protocolVersion element of their Application Session XML messages (refer to Section 2.2.2, “ECMA-323 Specified Tags”).
- The requestedDuration granularity is seconds, if no requestedDuration is provided by the application OpenScape Voice responds to the Start Application Session request with an actualDuration of 900 seconds (15 minutes). This is an OpenScape Voice default value and does not require provisioning.

- OpenScape Voice and application may negotiate for the actualDuration. The requestedDuration and actualDuration granularity is in seconds. OpenScape Voice supports an Application Session duration range of 120 seconds (2 minutes) minimum to 3600 seconds (1 hour) maximum.
- Once the session duration has been successfully negotiated, OpenScape Voice and application must preserve monitor monitorCrossReferenceIDs across temporary link failures or OpenScape Voice restarts for each active sessionID.
- The requestedDuration and actualDuration granularity is in seconds. OpenScape Voice supports an Application Session duration range of 120 seconds (2 minutes) minimum to 3600 seconds (1 hour) maximum.
- The following table defines the OpenScape Voice rules for delivering the actualDuration:

requestedDuration (from application)	**actualDuration (from OpenScape Voice)**	
	Start Application Session	**Reset Application Session Timer**
Within duration range	requestedDuration	requestedDuration
< minimum range value	Minimum duration value	Minimum duration value
> maximum range value	Maximum duration value	Maximum duration value
Not provided by application	900 seconds (15 minutes)	Last negotiated actualDuration

4.5.1.2 Application Session with Application Heartbeat (Fallback Call Distribution)

- The **extensions** parameter defined in ECMA 354 shall for the purpose of negotiating a Heartbeat Timeout value between OpenScape Voice and application.
- OpenScape Voice uses the negotiated Heartbeat value to trigger backup call distribution on specific Group Devices (MLHG).
- The proposed value for extension parameter in the service request is requestedHBT=<value in seconds>. The proposed value for the extension parameter in the service response is actualHBT=<value in seconds>.
- The requestedHBT and actualHBT parameter values shall be independent of the requestedDuration and actualDuration value used for the overall Application Session.
- The requestedHBT is a conditional parameter and should only be used when an application requires backup call distribution timeout on a Group Devices. Only one actualHBT is supported per application session. The actualHBT is

applied to a Group Device when the sessionID is specified by the application in the monitor start for the Group Device. Refer to Section 4.3.1.2, “Monitor Start” for details.

- The rules for used by OpenScape Voice to determine the actualHBT value are as follows:

requestedHBT (from application)	actualHBT (from OpenScape Voice)	
	Start Application Session	**Reset Application Session Timer**
< actualDuration for the session	requestedHBT	requestedHBT
> actualDuration for the session	Use the minimum session duration value	Use the minimum session duration value
Not provided by application	No HBT is used by application	Last negotiated actualHBT

- The application is required to send the Reset Application Session Timer before the HBT expires to maintain control of Group Device and prevent backup call distribution from starting. Both the requestedSessionDuration and HBT are optional. If not supplied the previously used values are to be re-used.
- Expiration of the HBT does not affect the active Application Session which remains active until the actualDuration timer expires.

Note: While ECMA 354 permits multiple application sessions for CSTA over SOAP, this is not the case for CSTA over TCP supported by OpenScape Voice. Only one Application Session per TCP link is supported by OpenScape Voice. OpenScape Voice negatively acknowledges all subsequent Start Application Session service requests received on a TCP link with an existing application session.

OpenScape Voice currently supports a maximum of 16 application links.

- All active Application Sessions are maintained by the OpenScape Voice standby node in the event of a switchover. In case of a switchover, if primary node has active Heartbeat Timers, these are restarted on the secondary node when the secondary node takes over.

4.5.2 Stop Application Session

The Stop Application Session service is used by the application to terminate an existing application session.

Service Request Parameters

Parameter Name	Supported	Comments
sessionID	Y	Specifies the globally unique identifier associated with the application session that is being stopped.
sessionEndReason	Y	Specifies the reason that the application session is being stopped. Either a standardized reason or an application specific reason may be used. The standardized set of reasons are: • normal – the application is no longer interested in maintaining this application association.
extensions	Y	Specifies non-standardized information.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in the service response definition below.

Positive Acknowledgement

Parameter Name	Supported	Comments
extensions	Y	Specifies non-standardized information.

Negative Acknowledgement

Parameter Name	Supported	Comments
errorCode	Y	Specifies the type of error. Either a standardized error or an application specific error may be used. The standardized set of errors are: • invalidSessionID – the sessionID is not valid or known by the server.
extensions	Y	Specifies non-standardized information.

OpenScape Voice Operational Notes

Refer to notes in Section 4.5.1, “Start Application Session”.

4.5.3 Reset Application Session Timer

The Reset Application Session Timer service is used by the application to reset the duration that an existing application session.

Service Request Parameters

Parameter Name	Supported	Comments
sessionID	Y	Specifies the globally unique identifier associated with the application session whose timer is being reset.
requestedSessionDuration	Y	Specifies the new value for the length of time (in seconds) that the application requests that the server maintain the application session.
extensions	Y	Heartbeat timer renegotiation is supported. Refer to usage notes in Section 4.5.1, “Start Application Session”.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Negative acknowledgement error values are defined in the service response definition below.

Positive Acknowledgement

Parameter Name	Supported	Comments
actualSessionDuration	Y	Specifies the new value for the length of time (in seconds) that the application session is maintained by the server. This value may be less than or equal to the requestedSessionDuration in the service request. If the requestedSessionDuration is not provided in the service request, the server provides a default value which is used for the application session.
extensions	Y	Heartbeat timer renegotiation is supported. Refer to usage notes in Section 4.5.1, “Start Application Session”

Negative Acknowledgement

Parameter Name	Supported	Comments
errorCode	Y	Specifies the type of error. Either a standardized error or an application specific error may be used. The standardized set of errors are: • invalidSessionID – the sessionID is not valid or known by the server. • serverCannotResetSessionDuration – the server cannot reset the session timer associated with the application session.
extensions	Y	Specifies non-standardized information.

OpenScape Voice Operational Notes

Refer to notes in Section 4.5.1, “Start Application Session”.

4.5.4 Application Session Terminated

The Application Session Terminated service is sent by a server when the server has terminated an application session.

Service Request Parameters

Parameter Name	Supported	Comments
sessionID	Y	Specifies globally unique identifier associated with the application session that is being terminated.
sessionEndReason	Y	Specifies the reason that the application session has been terminated. Either a standardized reason or an application specific reason may be specified. Supported parameters: • resourceLimitation – application session terminated due to resource constraints. • sessionTimerExpired – application session terminated due to the sessionTimer expiry.
extensions	Y	Specifies non-standardized information.

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Response Parameters

None

OpenScape Voice Operational Notes

Refer to notes in Section 4.5.1, “Start Application Session”.

4.6 Call Control

This subsection describes the Call Control features of this Standard. It includes:

- Call Control services
- Call Control events

4.6.1 Services

4.6.1.1 Accept Call (ONS Subscribers Only)

Attention: This section is for Siemens Enterprise Communications internal use only. Refer to Appendix F, “One Number Service (ONS)” for details.

OpenScape Voice supports Accept Call for devices provisioned for ONS-IO service only. An inbound call to an ONS provisioned subscriber remains in the alert-pending state for 2 seconds or until acted upon by the application.

Service Request Parameters

Parameter Name	Supported	Comments	
callToBeAccepted	Y	Specifies the connection to be accepted.	
		Initial State	Supported
		Alerting - Offered	Y

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model. Atomic means that only Offered Timer is stopped and the call progresses to the ONS subscriber’s registering device.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

ONS Usage

- Inbound provisioned and active switch services, such as call forwarding, group pickup, etc. will be started.

- If the subscriber device is currently unregistered or unreachable (does not respond to the setup) the call forward-dependable or call forwarding switching function service will be applied after the Accept Call service but before the device is alerted. This results in an immediate Diverted Event.

  Note: It may take up to 30 seconds for the switch to detect that the device is unreachable.

- Call forward-dependable service must be provisioned to address ONS configurations that use non-registering devices exclusively. Call forward-dependable is recommended to address inbound calls to a device that register but may become temporarily unreachable.

4.6.1.2 Alternate Call

The Alternate Call service places an existing active call on hold and then retrieves a previously held call. OpenScape Voice does not currently permit this service usage to place an active call on hold and then connect to an alerting or queued call at the same device (that is, to answer a call-waiting call).

Service Request Parameters

Parameter Name	Supported	Comments	
heldCall	Y	Specifies the held connection for the alternating device.	
		Initial State	Supported
		Alerting - Offered	N
		Alerting - Delivered	N
		Alerting – Entering Distribution	Y
		Hold	Y
		Queued	N
activeCall	Y	Specifies the active connection for the alternating device.	

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

- Alternate service is only supported for Siemens Enterprise Communications phones. Refer to Section 3.2.2.1, “SiemensType1 and CSTA over SIP Device Type configuration”.
- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications and is used over the CSTA interface between OpenScape Voice and OpenScape UC Application (Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.3 Answer Call

The Answer Call service connects an alerting call. This service is typically associated with devices that have attached speakerphone units and headset telephones to connect to a call using hands-free operation.

Service Request Parameters

Parameter Name	Supported	Comments	
callToBeAnswered	Y	Specifies the connection to be answered.	
		Initial State	Supported
		Alerting - Offered	N
		Alerting - Delivered	Y
		Alerting – Entering Distribution	N
		Initiated	N
		Queued	Y (Park to Station)

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model. Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

- Answer Call is possible if the called device has only 1 primary line registration active and no other secondary or phantom lines registered.

  Note: The called primary line DN may appear as secondary lines on other devices.

- If more than 1 contact is registered on the alerting device DN then Answer call is not possible.
- CSTA supports the following first party device control options for Answer Call in the following order depending on device support:

  a) uaCSTA

  b) Remote Control Talk Event Package

  c) Alert-Info header-field with Auto-Answer indication. Not supported for callback recall.

- If a call waiting call is answered the currently connected call is placed on hold and the alerting call waiting call is answered.
- ~~This service is supported for ONS-IO. Refer to PART III of the CSTA Interface Specification for details.~~

4.6.1.4 Call Back Call-Related

The Call Back Message Call-Related service allows a computing function to request that the switching function leave a pre-defined message requesting that the called device call the calling device. For example, the called device may have been busy when called.

Service Request Parameters

Note: This service is only allowed for alerting or busy calls.

<table>
<tr><th>Parameter Name</th><th>Supported</th><th colspan="2">Comments</th></tr>
<tr><td rowspan="11">callbackConnection</td><td rowspan="11">Y</td><td colspan="2">Specifies the callback connection at the calling device.
The callback connection may include ONS binding (refer to operational note 3.)</td></tr>
<tr><td>Initial Local Connection Information</td><td>D1C1</td></tr>
<tr><td>Alerting - Offered</td><td>N</td></tr>
<tr><td>Alerting - Delivered</td><td>Y</td></tr>
<tr><td>Alerting - Entering Distribution (Hunt Group)</td><td>N</td></tr>
<tr><td>Connected</td><td>*N1</td></tr>
<tr><td>Failed</td><td>Y</td></tr>
<tr><td>Hold</td><td>N</td></tr>
<tr><td>Initiated</td><td>N</td></tr>
<tr><td>Queue</td><td>N</td></tr>
<tr><td colspan="2">* if D2 is across a network interface that supports callback service then callback is possible in connected state on N1C1. OpenScape Voice represents N1 as D1.</td></tr>
<tr><td>callCharacteristics</td><td>N</td><td colspan="2">Specifies the high level characteristics</td></tr>
<tr><td>SubjectOfCall</td><td>N</td><td colspan="2">Specifies the subject/intent of the call</td></tr>
<tr><td>languagePreference</td><td>N</td><td colspan="2">Specifies the language preferences to be associated with the call</td></tr>
<tr><td>security</td><td>N</td><td colspan="2">Specifies timestamp information, message number, and security information</td></tr>
<tr><td>privateData</td><td>N</td><td colspan="2">Specifies non-standardized information</td></tr>
</table>

Acknowledgement Model

OpenScape Voice supports the atomic positive acknowledgement model.

Positive Response Parameters

Parameter Name	Supported	Comments
targetDevice	Y	Specifies the deviceID of the device that the call back was initiated for (See operational note 4).
security	N	Specifies timestamp information, message number, and security information.
privateData	N	Specifies non-standardized information.

Response Parameters

If Callback Call-Related service cannot be invoked OpenScape Voice shall respond with an appropriate CSTA Error.

Possible CSTA errorValues include:

- invalidConnectionState – if callbackConnection is not alerting or busy state
- requestIncompatibleWithDevice – targetDevice (alerting or busy device) does not support callback service
- invalidCallID – unknown callID
- privilegeViolationSpecifiedDevice: There is a limit in callback requests that a user can initiate. If a user exceeds this limit the response will be this one; Or the callback cannot be activated temporarily. In a short period of time a reactivation may be successful. Or the callback cannot be activated for a long period of time.
- featureAlreadySet: A callBack request already exists on a target device
- invalidDeviceID: CCS fails to verify the FQN from the mem slot vs the FQN from the target device.

OpenScape Voice Operational Notes

- The calling device’s local connection state must be connected.
- The target device's local connection state must be Delivered (alerting) or Failed (e.g., Busy).

Note: D2 is across a network interface that supports callback service then callback is possible in connected state on N2C1.

- The targetDevice in the service response shall be presented in FQN (if possible based on provisioning of number translation).
- If callback connection includes media other than voice (e.g., image) the call back shall be set but only voice media shall be invoked in the callback-recall setup.

4.6.1.5 Camp on Call

Service Not Supported

The CampOn Call service allows the computing function to queue a call for a device (that typically is busy) until that device becomes available (after finishing a current call or any previously queued calls, for example).

4.6.1.6 Clear Call

Service Not Supported

The Clear Call service releases all devices from an existing call. In the case of a conference call, this results in all devices in the conference call being released from the call.

4.6.1.7 Clear Connection

The Clear Connection service releases a specific device from a call. In the case of a two-party call, this may result in the call being torn down. In the case of a conference call, this results in the specific party being removed from the conference.

Clear Connection can also be used on a connection in the Offered state to effectively reject the call.

Service Request Parameters

Parameter Name	Supported	Comments		
connectionToBeCleared	Y	Specifies the connection to be cleared.		
		Initial State	**Supported**	**Note**
		Alerting - Offered	Y	10
		Alerting - Delivered	Y	4
		Alerting – Entering Distribution	Y	
		Connected	Y	
		Failed	Y	
		Hold	Y	1, 7
		Initiated	Y	
		Queued	Y	7
reason	N	Specifies the reason the connection is being cleared (busy, for example).		

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined inSection 2.6.2, “Negative Service Response”.

Response Parameters

None

Miscellaneous Characteristics

DeviceIDOnly -The switching function accepts and supports the DeviceID only format of the Connection ID for this service.

OpenScape Voice Operational Notes

1. The Clear Connection service does not automatically retrieve a held call. If an application wants to clear an active call and retrieve a currently held call, the Reconnect service must be used instead of Clear Connection.
2. The Clear Connection service results in a negative acknowledgement if the clearing party is connected to a conference and has a call on soft hold.
3. If the clearing device's Device ID refers to an extension that appears on more than one device (multiple appearance), the Clear Connection service is attempted only on the device where the specified extension number is configured as its primary device, and only if no other appearances are active (that is, the Connection State is *connected*) on that device. If these conditions are not met, a negative response is returned. In addition, if an appearance of the primary device is connected into the call (bridged conference), a negative response is returned.
4. If the primary device is ringing, other appearances of that line are also cleared.
5. The clearing party cannot be the target party of an executive override.
6. After the successful execution of the Clear Connection service, the clearing device and any non-conferenced devices in the call transition from connected, to failed, and to null or connected to null.
7. A held or queued connection can only be cleared if there is no other active connection at the clearing device.
8. The Clear Connection service results in a negative acknowledgement if the clearing party has more than one connection and the service request was initiated with DeviceIDOnly.
9. If the target device is a SIP phone that supports uaCSTA, OpenScape Voice may use uaCSTA to clear the connection at this device. The CSTA application has no control if uaCSTA is used or not.
10. Clear Connection does not use uaCSTA if the call is in the Offered state. At this point the call is not established at a physical device.

4.6.1.8 Conference Call

The Conference Call service 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 and the two connections at the conferencing device are resolved into a single connection. The Connection IDs formerly associated with the conferenced connections are released and a new Connection ID for the resulting connection is created. The existing held call may consist of two or more devices.

Service Request Parameters

Parameter Name	Supported	Comments	
heldCall	Y	Specifies the held connection.I	
		Initial State	Supported
		Alerting - Offered	N
		Alerting - Delivered	N
		Alerting – Entering Distribution	N
		Connected	N
		Hold	Y
		Queued	N
activeCall	Y	Specifies the active connection.	
		Initial State	Supported
		Connected	Y
		Hold	N

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
conferenceCall	Y	Specifies the resulting connection to the new call. The ConnectionID shall have the CallID of the resulting conference call and the DeviceID of the conferencing device.

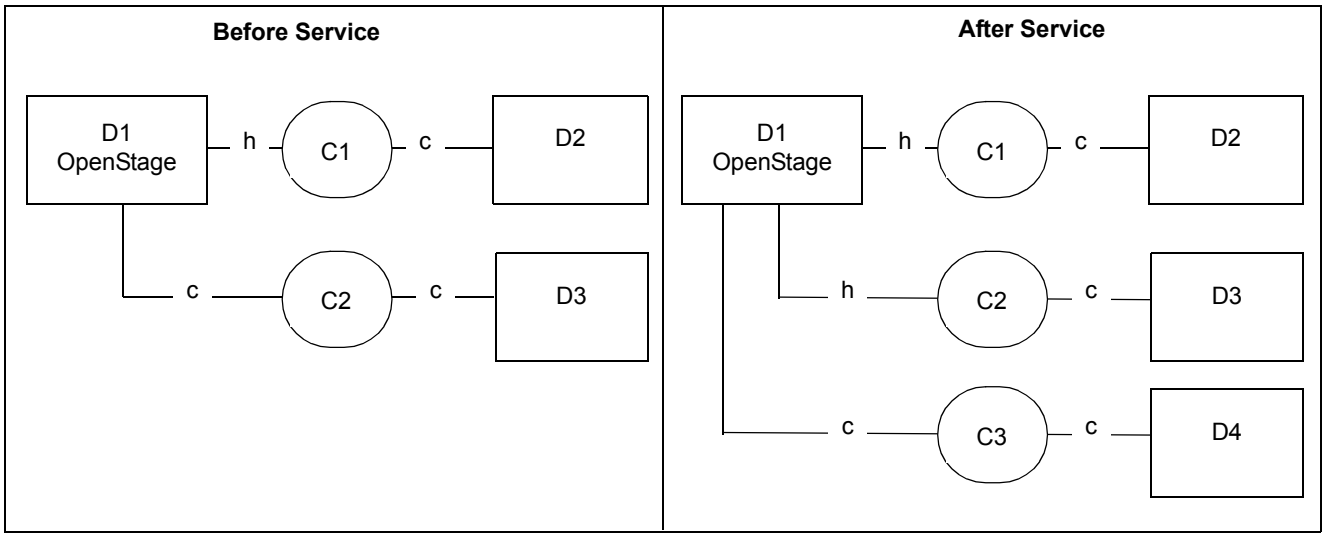
OpenScape Voice Operational Notes

1. Adding a party to an *existing* conference is only supported for Siemens Enterprise Communications phones. Refer to Section 3.2.2.1, “SiemensType1 and CSTA over SIP Device Type configuration”.
2. CSTA Subscriber must be provisioned for Large Conference Service.
3. Large Conference service requests may be rejected based on limitations and constraints such as:
   - Subscriber is not provisioned for large conference service
   - Three-way call may not be supported when active leg is the result of incoming call, for example. call waiting or pickup group.
   - Number of participants would be exceeded. SIP Large Conference Service supports from 3 to 48 conference members.
   - Media Service pool resources not available
4. Only voice media is supported by the Large Conference Service.
5. Service is not supported for control of SIP local device conferencing.
6. Service is not support to invoke a bridged appearance.

4.6.1.9 Consultation Call

This service places an existing active call at a device on hold and initiates a new call from the same device. The existing active call may include two or more devices (e.g., conference).

OpenStage phones support the capability to invoke a 3rd call leg after answering a waiting call or picking a call during an existing call. A 3rd call leg may be invoked via the Consultation Call service. Refer to PART II for detailed event flows.



Service Request Parameters

Parameter Name	Supported	Comments	
existingCall	Y	Specifies the active connection.	
		Initial State	**Supported**
		Connected	Y
consultedDevice	Y	Specifies the device to be consulted.	
accountCode	N	Specifies the account code to associate with the consulted call.	
authCode	N	Specifies the authorization code to allow the call.	
callCharacteristics	N	Specifies the high level characteristics (Priority call, for example) to be associated with the call.	

Parameter Name	Supported	Comments
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** Voice and Image are supported to create a new video call for this service. **Note:** IM is not supported in combination with voice and image. IM is always created as a separate connection.
subjectOfCall	N	Specifies the subject/intent of the call.

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
initiatedCall	Y	Specifies the initial connection to the new call. The ConnectionID shall have the CallID of the resulting new call and the DeviceID of the consulting device.

Miscellaneous Characteristics

Multistage dialing is ***not*** supported.

OpenScape Voice Operational Notes

1. Prior to the consultation, the connection at the consulting device must be connected or a negative response is returned.
2. After the successful execution of the consultation, the active connection at the consulting device is in the connected state, and the consultation-held connection at the consulting device is in the hold state (HELD is shown in the phone).
3. After successful execution of the consultation, the connection at the consulted device are alerting, queued (if consulted device is a hunting group), or null (if a feature is active such as call forwarding immediate).
4. If the active call has been placed on consultation hold, but OpenScape Voice is unable to extend the call to the called device, the application must use the Reconnect service to retrieve the party on consultation hold.

5. If the consulting device's Device ID refers to an extension number that appears on more than one device (multiple appearance), the Consultation Call service is attempted only on the device where the specified extension number is configured as its primary device, and only if no other appearances are active (that is, the Connection State is *connected*) on that device.
6. The SIP phone of the holding party is in HELD state, and all restrictions of phone features imposed by this phone state are still applicable.
7. The audible tone or announcements depend on provisioning and if tones are provided by endpoint or OpenScape Voice. If held leg is controlled by OpenScape Voice Conference service no tones or announcements are provided to the held conferees.
8. If the physical consulting device supports uaCSTA (e.g., OpenStage) then it may be possible to invoke a 3rd call leg for the active call via the Consultation Call service.

Note: Consultation call service will be presented in the servicesPermitted parameter for active call when the phone supports uaCSTA. However, the phone will accept a uaCSTA Consultation Call request only under the following conditions:
- after answering a waiting call
- after a Group or Direct Pickup during an active call

This is a known limitation which may cause the Consultation Call request to be rejected.

4.6.1.10 Deflect Call

The Deflect Call service allows the computing function to divert a call to another destination that may be inside or outside the switching sub-domain.

Service Request Parameters

Parameter Name	Supported	Comments	
callToBeDiverted	Y	Specifies the connection to be diverted.	
		Failed	**Supported**
		Alerting - Offered	Y
		Alerting - Delivered	Y
		Alerting – Entering Distribution	Y
		Connected	N
		Failed	N
		Hold	N
		Queued	Y
newDestination	Y	Specifies the device to which the call is to be diverted.	
accountCode	N	Specifies the account code to associate with the consulted call.	
authCode	N	Specifies the authorization code to allow the call.	
callCharacteristics	N	Specifies the high level characteristics (Priority call, for example) to be associated with the call.	
mediaCallCharacteristics	N	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. This parameter is ignored by OpenScape Voice on the service request and the existing media is retained diverted call.	
subjectOfCall	N	Specifies the subject/intent of the call.	

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

1. This service is supported for ONS-IO.

   Attention: One Number Service (OND) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

2. Currently CSTA Deflections to internal or on-net devices do not provide loop protection.

4.6.1.11 Dial Digits

Service Not Supported

The Dial Digits service allows the computing function to perform a dialing sequence that is associated with a call that has already been initiated (that is, has manually gone off-hook or has been initiated using a Make Call or Consultation Call service). This service is also used to perform the dialing sequences associated with completing a multi-stage dialed call.

Note: See Generate Digits in Section 4.7.1.1, “Associate Data”.

4.6.1.12 Directed Pickup Call

Service is Not yet supported

The Directed Pickup Call service moves a specified call and connects it at a new specified destination.

Refer to PART II of the CSTA Interface Specification for manual phone activation of Call Pickup - Directed CSTA event flow.

4.6.1.13 Group Pickup Call

Service is Not yet supported

The Group Pickup Call service moves a call that is a member of a specified or default pickup group to a new specified destination. This results in a connection in a pickup group to be connected to a new specified destination inside the switching sub-domain.

Refer to PART II of the CSTA Interface Specification for manual phone and SIP-Q (Network) activation of Call Pickup - Group event flow.

4.6.1.14 Hold Call

The Hold Call service places a connected connection on hold at the same device.

Service Request Parameters

Parameter Name	Supported	Comments	
callToBeHeld	Y	Specifies the active connection to be held.	
		Initial State	**Supported**
		Connected	Y

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

- This service interrupts communication for an existing call at a device. The relationship between the holding device and the held call is maintained until the call is retrieved from the held state or until the call is cleared.
- This service currently does not provide a CSTA recall time-out. Recall is handled by phone or OpenScape Voice service directly.
- Only one call can be put on hold using the Hold Call service. While this call remains on hold, subsequent Hold Call service requests are denied with a negative response.
- This call must be in the connected state on the devices’ primary line or a negative response is returned. In a consultation call scenario, the holding device may be the consulted party. In a conference call scenario, the holding device must be a conference member or the party who was consulted by a conference member.
- If the target device is a SIP phone that supports uaCSTA, OpenScape Voice may use uaCSTA to place the call on hold. The CSTA application has no control if uaCSTA is used or not.
- The audible tone or announcements depend on provisioning and if tones are provided by endpoint or OpenScape Voice. If held leg is controlled by OpenScape Voice Conference service no tones or announcements are provided to the held conferees.

- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.15 Intrude Call

Service Not Supported

The Intrude Call service adds the calling device to a call at a busy called device. Depending upon the switching function, the result is that the calling device is either actively or silently participating in the called device’s existing call or consulting with the called device with a new call.

4.6.1.16 Join Call

The Join Call service allows a computing function to request, on behalf of a device, that the device be joined into an existing call. In the process of establishing a connection with the joining Device, the joining Device may be prompted to go off-hook (if necessary) and when that device does so, it is added into the call. This service is different from the Single Step Conference service in that the request is made on behalf of the joining Device (originating device). This service is different from the Intrude Call service in that there is no prior failed call at the intruded upon connection.

Service Request Parameters

<table>
<tr><th>Parameter Name</th><th>Supported</th><th colspan="2">Comments</th></tr>
<tr><td rowspan="9">activeCall</td><td rowspan="9">Y</td><td colspan="2">Specifies an existing connection in an active call to which the new device is to be added (or joined).</td></tr>
<tr><th>Initial State</th><th>Supported</th></tr>
<tr><td>Alerting - Offered</td><td>N</td></tr>
<tr><td>Alerting - Delivered</td><td>N</td></tr>
<tr><td>Alerting - Entering Distribution</td><td>N</td></tr>
<tr><td>Connected</td><td>Y</td></tr>
<tr><td>Failed</td><td>N</td></tr>
<tr><td>Hold</td><td>N</td></tr>
<tr><td>Queue</td><td>N</td></tr>
<tr><td>joiningDevice</td><td>Y</td><td colspan="2">Specifies the device that is to be added to (join) the existing call.</td></tr>
</table>

Parameter Name	Supported	Comments
autoOriginate	Y	Specifies if the joining device is to be prompted or not (hands-free mode). • Prompt • Do Not Prompt (auto originate) - Default for Join Call service
participationType	Y	Specifies the type of participation the joining device has in the resulting call. • **Silent** - the joining device can listen but cannot actively participate in the resulting conference call. As a result, the flow direction of the joiningDevice's connection (i.e., conferenced call) will be Receive. In this configuration, when either the calling or the called party hangs up or Clear the Connection via CSTA, the conference bridge is released automatically. • **Active** (Default) - the joining device can actively participate in the resulting conference call. As a result, the flow direction of the joiningDevice's connection (i.e., conferenced call) will be Transmit & Receive. When a device is joined actively, each connection to the conference is independent, i.e. the conference bridge shall not be dropped until all parties hang up or a ClearConnection is received on each individual connection.

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
conferenceCall	Y	Specifies the callID of the existing active call and the DeviceID of the joining device.
conferenceCallInfo	Y	Specifies the connection information associated with the conferenced call connection, i.e. silent.

Join Call Event Flow (Basic)

Refer to CSTA Call Scenarios for additional detailed flows.

Example:

- D1 and D2 are connected.
- Application joins D3 (with prompting) to the active connection D1 - D2.

Note: Services Initiated event is not sent in the case where joining device is no prompted.

#	Device Monitor	Event	Event Cause	ConnectionInformation FlowDirection	Comments
1	D1	Conferenced	silentParticpation	Transmit&Receive	D1 is informed about the Joined connection
2		ServiceInitiated	joinCall	n/a	D3 prompting
3		Established	silentParticpation	Transmit&Receive	D3's connection State is Connected
4	D2	Conferenced	silentParticpation	Transmit&Receive	D2 is informed about the Joined connection
5		ServiceInitiated	joinCall	n/a	D3 prompting
6		Established	silentParticpation	Transmit&Receive	D3's connection State is Connected
7	D3	Conferenced	silentParticpation	Receive	D3 is informed about the Joined connection
8		ServiceInitiated	joinCall	n/a	D3 prompting
9		Established	silentParticpation	Receive	D3's connection State is Connected

OpenScape Voice Operational Notes

- Silent Monitoring and Recording services are supported by manual dialing access code. Refer to CSTA Call Scenarios for event flows.
- Monitored connection may be transferred.
- It is possible to join an active conference.
- It is possible to change the flow direction via the Change Connection Information call associated service. For example, you can change the flow direction on the silent monitoring device from “Receive” to “Transmit&Receive”.
- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.17 Make Call

The Make Call service allows the computing function to set up a call between a calling device and a called device.

The service creates a new call and establishes an initiated or connected connection with the calling device. The Make Call service assigns a ConnectionID to the calling device and returns it in the positive acknowledgement.

Service Request Parameters

Parameter Name	Supported	Comments
callingDevice	Y	Specifies the calling/originating device. OpenScape Voice supports only station deviceID in make call request. This deviceID must be the service ID for the provisioned subscriber DN.
		Initial State: Null — Supported: Y
		Initial State: Null — Supported: N
calledDirectoryNumber	Y	Specifies the called device.
accountCode	N	Specifies the account code to associate with the consulted call.
authCode	N	Specifies the authorization code to allow the call.
autoOriginate	Y	Specifies if the calling device's connection is automatically answered (hands-free mode). The complete set of possible values is: • Prompt • Do Not Prompt (auto originate) – Default for Make Call service using OpenScape Voice 3PCC with a Siemens Enterprise Communications phone
callCharacteristics	N	Specifies the high level characteristics (Priority call, for example) to be associated with the call.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **NOTE:** • Voice and Image are supported to create a new video call for this service. • IM is not supported in combination with voice and image. IM is always created as a separate connection.
subjectOfCall	N	Specifies the subject/intent of the call.

Parameter Name	Supported	Comments
reason	N	Specifies the reason the connection is being cleared (busy, for example).
privateData	Y	Non-standardized information.

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
callingDevice	Y	Specifies the initial connection to the new call. The ConnectionID shall have the CallID of the resulting new call and the DeviceID of the calling device. Note that the calling device parameter in the service request may be different from the deviceID in the connectionID of callingDevice in the positive acknowledgement (when the callingDevice in the service request represents a group of stations, for example).

Miscellaneous Characteristics

- Auto Originate default may be overridden by the application, prompting for calling device is supported.
- MakeCall while calling device is off-hook is supported but may be blocked by SIP device configuration (i.e. busy while dialing).
- MakeCall for a group device is not supported (for example, Hunt Group – MLHG)

OpenScape Voice Operational Notes

- Auto originate = doNotPrompt is possible if the calling device has only 1 primary line registration active and no other secondary or phantom lines registered.

  Note: The primary line DN may appear as secondary lines on other devices.

- The uaCSTA Make Call service may be used to originate registered calling device supports uaCSTA, e.g., Siemens Enterprise Communications OpenStage phone.

- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.18 Make Predictive Call

Service Not Supported

The Make Predictive Call service shall originate a call between two devices by first creating a connection to the called device. The service returns a positive acknowledgement that provides the connection at the called device.

4.6.1.19 Park Call

Service Not Supported

The Park Call service moves a specified call at a device to a specified (parked-to) destination. The device on whose behalf Park Call is invoked (the parking device) is no longer associated with the call (except when the parking device parks a call back to the parking device).

Note: OpenScape Voice supports a manual Park to Server feature. The Park-to-server feature is activated by creating a consultation call to Park-to-server access code. The Park-to-server scenarios expose a **hard-coded** device ID in the CSTA event flow to represent the system park slot:: ***N<ABC1>Park Slot***. For details refer to Park-to-Server event flows in PART II and IV of the CSTA Interface Specification

4.6.1.20 Reconnect Call

The Reconnect Call service clears a specified connection at the reconnecting device and retrieve a specified held connection at the same device.

Service Request Parameters

Parameter Name	Supported	Comments	
activeCall	Y	Specifies the connection to be cleared.	
		Initial State	Supported
		Alerting - Offered	N
		Alerting - Delivered	N
		Alerting – Entering Distribution	N
		Connected	Y
		Failed	N
		Queued	N
heldCall	Y	Specifies the held connection.	
		Initial State	Supported
		Hold	Y

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

- Reconnect service is only supported for Siemens Enterprise Communications phones. Refer to Section 3.2.2.1, “SiemensType1 and CSTA over SIP Device Type configuration”.
- If the reconnecting device’s Device ID refers to an extension number that appears on more than one device (multiple appearances), the Reconnect Call service is attempted only on the device where the specified extension number is configured as its primary device, and only if no other appearances are active (that is, the Connection State is *connected*) on that device.

- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.21 Retrieve Call

The Retrieve Call service connects a specified held connection.

Service Request Parameters

Parameter Name	Supported	Comments	
callToBeRetrieved	Y	Specifies the held connection to be retrieved.	
		Initial State	**Supported**
		Hold	Y

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

None

OpenScape Voice Operational Notes

- In the case of a manual hold invoked by the endpoint, this service requires that the phone type be SiemensType1 or uaCSTA over SIP Section 3.2.2.1, “SiemensType1 and CSTA over SIP Device Type configuration”].
- If the retrieving device’s DeviceID refers to an extension number that appears on more than one device (multiple appearance), the Retrieve Call service is only attempted on the device where the specified extension number is configured as its primary device, and only if no other appearances are active on that device.
- If the target device is a SIP phone that supports uaCSTA, OpenScape Voice may use uaCSTA to retrieve this call. The CSTA application has no control if uaCSTA is used or not.

- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.22 Send Message

Service Not Supported

The Send Message service allows the computing function to send a message to one or more devices. The message, composed of one or more MIME body parts, is included in the Send Message service request.

4.6.1.23 Single Step Conference Call

Service Not Supported

The Single Step Conference Call joins a new device into an existing call.

This service can be repeated to make n-device conference calls (subject to switching function limits). This service is distinguished from the Join Call service by the way the device being added to the call perceives the direction of the resulting connection (for example, alerts). In the case of the Join Call service, the device generates an outgoing connection (for example, prompts). This affects the parameters associated with the service and the events flowing as a result of the service.

4.6.1.24 Single Step Transfer Call

The Single Step Transfer Call service transfers an existing connected connection at a device to another device.

This transfer is performed in a single-step, where the device doing the transfer does not have to place the existing call on hold before issuing the Single Step Transfer Call service.

Service Request Parameters

Parameter Name	Supported	Comments
activeCall	Y	Specifies the connected connection in the call to be replaced
		Initial State / **Supported**
		Connected / Y
transferredTo	Y	Specifies the new called (transferredTo) device.
accountCode	N	Specifies the account code to associate with the consulted call.
privateData	Y	The xml format used for Single Step Transfer to Voice Mail is provided in Section D.5, “Single Step Transfer to Voice Mailbox”.
reason	N	Specifies the reason the connection is being cleared (busy, for example).

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
transferredCall	Y	Specifies the ConnectionID of the transferredTo device in the transferred call.

OpenScape Voice Operational Notes

- If the transferring device’s Device ID refers to an extension number that appears on more than one device (multiple appearance), the Single Step Transfer Call service is only attempted on the device where the specified extension number is configured as its primary device, and only if no other appearances are active on that device.

- Prior to the Single Step Transfer, the local connection states of the active call at the transferring device and the transferred device must both be connected or a negative response is returned. This service is only supported for two-party calls; the active call cannot be a conference call or a consultation call.
- If the target is an invalid number, a Negative Ack is sent, not a positive response. For all the other cases, if a Positive Response is generated and the transfer does not take place, Failed and ConnectionCleared is generated
- In the case of network congestion condition in which the call cannot be transferred because there is no gateway available, a Positive Response is generated, but the transfer does not take place then Failed and ConnectionCleared events are generated.
- If the transferredTo device is call forwarded to another local party, the original SST target is indicated in the service response.
- After successful execution of the Single Step Transfer or manual blind transfer, the transferring device is placed into the blocked state (Failed Event) until the transfer is completed beyond the point of recall, then the blocked connection is cleared. Refer to Part II CSTA Call Scenarios for detailed event flows.
- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.1.25 Transfer Call

The Transfer Call service transfers a call held at a device to an active call at the same device. The held and active calls at the transferring device merges into a new call. Also, the Connections of the held and active calls at the transferring device becomes Null and their ConnectionIDs ia released (that is, the transferring device is no longer involved with the call).

Service Request Parameters

Parameter Name	Supported	Comments	
heldCall	Y	Specifies the held connection.	
		Initial State	Supported
		Hold	Y
		Connected	N
activeCall	Y	Specifies the active connection.	
		Initial State	Supported
		Hold	Y
		Connected	N

Acknowledgement Model

OpenScape Voice supports the multi-step positive acknowledgement model.

Negative acknowledgement error values are defined in Section 2.6.2, “Negative Service Response”.

Response Parameters

Parameter Name	Supported	Comments
transferredCall	Y	Specifies the ConnectionID of the transferredTo device in the resulting call.

OpenScape Voice Operational Notes

- Connections on hold cannot be transferred. Conferences on hold cannot be transferred.
- Prior to the transfer, the transferring device must have a connection in the hold connection state, and a connection in the connected connection state, or a negative response is returned.
- Prior to the transfer, the connection at the transferred-to device must be either connected, hold, alerting or queued (group device only) or a negative response is returned.
- Prior to the transfer, the connection at the transferred device must be connected or a negative response is returned.

- After the successful transfer, the connection at the transferred device is still connected and the connection at the transferred-to-device is connected or alerting.
- If the transferring device's Device ID refers to an extension number that appears on more than one device (multiple appearances), the Transfer Call service is attempted only on the device where the specified extension number is configured as its primary device, and only if no other appearances are active on that device.
- If the transferred-to device was call forwarded to-another party, the forwarded-to-party is indicated in the service response.
- This service is supported for ONS-IO.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, "One Number Service (ONS)" for details.

4.6.2 Events

OpenScape Voice supports servicesPermitted parameter as defined in Section 2.6.3, “Dynamic Feature Presentation (using servicesPermitted)”.

4.6.2.1 Bridged

Event Not Supported

The Bridged event indicates that an appearance at a shared bridged device configuration has been placed into an inactive mode (that is, queued state).

4.6.2.2 Call Cleared

Event Not Supported

The Call Cleared event is only provided for calls that are being call-type monitored. This event indicates that a call has been cleared and no longer exists within the switching sub-domain. A call is cleared when there is no longer any device associated with the call.

4.6.2.3 Conferenced

The Conferenced event indicates that the conferencing device has conferenced itself or another device with an existing call and that no devices have been removed from the resulting call.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
primaryOldCall	Y	The switching function provides the local view option. The primaryOldCall specifies first active call leg on monitored device
secondaryOldCall	Y	The switching function provides the local view option. The secondaryOldCall specifies the second active call on the monitored device.
conferencingDevice	Y	Specifies the device ID of the conferencing device. **Note:** OpenScape Voice does not apply privacy restrictions to this parameter. Applications shall never display this parameter to other conference members.

Parameter Name	Presented	Comments
addedParty	Y	The addedParty specifies the device ID of the device that belongs to the active call of the conference. The device ID may be represented by Switching Function Representation or Device Number or Not Known.
conferenceConnections	Y	The conferenceConnections parameter is a list that contains the new ConnectionIDs and the old ConnectionIDs of the conference and for externally located devices the associated Network Interface DeviceID. OpenScape Voice provides connectionList with the following parameters: newConnection (conference connection) endpoint (deviceID only, in GNF or FQPN when available) resultingConnectionInformation flowDirection – Transmit&Receive – Receive (e.g, silent monitoring) – Transmit
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. • Conferencing device – Connected • Other devices - See Table 17-148 in ECMA 269
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported value: • Voice
callLinkData	N	Specifies the correction data associated with the call.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in the Section 4.1.1.5, “Get Switching Function Devices”
privateData	Y	Non-standardized information.

Event Causes

Cause Code	Conferenced Event	Example Reasons for Cause Code
Active Participation	Yes	Join Call, Silent Monitoring
Conference	Yes	Conference Call, Conference
Join Call	Yes	Join Call
Network Signal	No	External Call
Normal	No	Conference
Override	No	Intrude Call
Silent Participation	Yes	Join Call, Silent Monitoring

Miscellaneous Characteristics

- Local view shall be provided.

OpenScape Voice Operational Notes

- CSTA Subscriber must be provisioned for Large Conference Service.
- Event is not provided for control of SIP local device conferencing. Local SIP conference results in two connected calls.
- Silent Participation cause code requires special handling by application to ensure that devices involved in silent monitoring are not aware of joining device.
- There are cases where multiple external deviceIDs exist in the conferenceConnection list. This is non-standard CSTA implementation. Repeated ConnectionIDs in a conference can not be cleared via CSTA clear connection service.

4.6.2.4 Connection Cleared

The Connection Cleared event indicates that a single device has disconnected or dropped out of a call.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
droppedConnection	Y	Specifies the connection of the device that was dropped from the call.
releasingDevice	Y	Specifies the device that dropped from the call.
localConnection	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call: • Clearing device: Null • All other left in the call: Unaffected.
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered cleared by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in the Section 4.1.1.3, “Get Switching Function Capabilities”
droppedConnectionInfo	N	Specifies the connection information associated with the dropped connection.
callLinkageData	N	Specifies the correlator data associated with the call.
privateData	Y	Non-standardized information.

Event Causes

Cause Code	Clear Connection	Example Reasons for Cause Code
Alert Time	N	Make Predictive Call
Busy	Y	Connection Failure
Busy Overflow	N	Clear Connection, Clear Call, Connection Failure
Calendar Overflow	N	Clear Connection, Clear Call, Connection failure
Call Back	Y	Call Back Call-Related, Call Back Message Call-Related
Call Cancelled	N	Clear Connection, Clear Call, Connection Failure
Call Not Answered	Y	Clear Connection, Clear Call, Connection failure
Capacity Overflow	N	Clear Connection, Clear Call, Connection Failure
Destination Detected	N	Make Predictive Call
Destination Not Obtainable	N	Connection Failure
Destination Out of Order	N	Connection Failure
Do Not Disturb	N	Do Not Disturb
Key Operation	Y	Bridged Call
Incompatible Destination[1]	N	Connection Failure
Invalid Account Code	N	Connection Failure
Invalid Number Format	N	Connection Failure
Maintenance	N	Connection Failure
Network Congestion	N	External Call
Network Not Obtainable	N	External Call
Network Out of Order	N	Connection Failure
Network Signal	N	Clear Connection, Clear Call, Connection Failure, External Call
Normal Clearing	Y	Clear Connection, Clear Call, Any feature
Not Available Bearer Service	N	Connection Failure
Not Supported Bearer Service	N	Connection Failure
Number Changed	N	Connection Failure
Number Unallocated	N	Connection Failure
Override	N	Connection Failure
Queue Cleared	N	ACD
Path Replacement	N	Network Feature

Cause Code	Clear Connection	Example Reasons for Cause Code
Queue Time Overflow	N	Clear Connection, Clear Call, Connection Failure
Reorder Tone	Y	Connection Failure
Resource not Available[2]	N	Connection Failure (generic – transient)
Selected Trunk Busy	N	Connection Failure
Trunks Busy	N	Connection Failure
Unauthorized Bearer Service	N	Connection Failure
Unknown Overflow	N	Clear Connection, Clear Call, Connection Failure
[1] OSCAR PROPOSAL: This cause shall be used for generic persistence connection failures unless an OSCAR specified cause code can be used. [2] OSCAR PROPOSAL: This cause shall be used for generic transient connection failures unless an OSCAR specified cause code can be used.		

OpenScape Voice Operational Notes

The connection cleared event is also provided when a device is removed from a call due to the call being transferred or diverted to another device. (The Transferred and Diverted events are used in these cases.)

4.6.2.5 Delivered

The Delivered event indicates that a call is being presented to a device in either the Ringing or Entering Distribution modes of the alerting state.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
connection	Y	Specifies the connection that is alerting.
alertingDevice	Y	Specifies the device that is alerting.
callingDevice	Y	Specifies the device that is calling.
calledDevice *	Y	Specifies the originally called device.
lastRedirectionDevice	Y	Specifies the previously known redirected from device.
originatingNIDConnection	N	Specifies the connection of the Network Interface Device (NID) that the call originated from.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. Alerting device: Alerting Calling device: is unaffected
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and is not provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Presented	Comments
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in theSection 4.1.1.3, “Get Switching Function Capabilities”.
connectionInfo	Y	Specifies the connection information associated with the alerting connection. OpenScape Voice presents the flowDirection information (e.g. 1-way speaker call): • Transmit&Receive • Receive • Transmit
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered delivered by OpenScape Voice.
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Cause Code	Delivered Event	Example Reasons for Cause Code
ACD Busy	N	ACD, Consultation Call
ACD Forward	N	ACD
ACD Saturated	N	ACD, Consultation Call
Call Back	Y	Call Back Call (non-Call Related)
Call Forward	Y	Call Forwarding (generic / not specified)
Call Forward - Busy	Y	Call Forwarding (Busy)
Call Forward - Immediate	Y	Call Forwarding (Immediate)
Call Forward - No Answer	Y	Call Forwarding (No Answer)
Conference	N	Meet-Me Conference
Distributed	Y	ACD
Entering Distribution	Y	ACD
Key Operation	N	Multiple Appearance
Multiple Alerting	N	Multiple Alerting – Not yet supported
Network Signal	Y	External Calls
New Call	Y	Any feature (not already addressed by a specific event cause)
No Available Agents	N	ACD, Forwarding
Normal	N	Any feature (not supported, see new call)
Overflow	N	ACD (see call forward)
Override	N	Intrude Call
Recall	Y	Recall (generic / not specific)
Recall - Busy	Y	Recall
Recall - No Answer	Y	Recall
Recall - Forwarded	Y	Recall
Recall - Resources Not Available	Y	Recall
Redirected	Y	Deflect Call
Remains in Queue	N	ACD, Queuing, Single Step Conference, Join Call
Resources not available	N	ACD, Forwarding
Single Step Transfer	Y	Single Step Transfer
Single Step Conference	N	Single Step Conference
Timeout	N	External Calls

OpenScape Voice Operational Note

If a Group Device is provisioned for Queuing, OpenScape Voice sends a Delivered event before the Queued Event. See *Group Device queuing example flows in PART II - CSTA Call Scenarios*.

4.6.2.6 Dialed Digits

Event Not Supported

The Digits Dialed event indicates that a call or feature is being attempted from a device and that a portion of the dialing sequence has been completed. It implies that only part of the input activity is complete, and that more of the dialing sequence needs to be supplied before the entire input activity is complete. After the entire dialing sequence is complete, the Originated event is generated in the case where a call is being attempted.

4.6.2.7 Diverted

The Diverted event indicates that a call has been diverted from a device and that the call is no longer present at the device.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
connection	Y	Specifies the connection that was diverted.
divertingDevice	Y	Specifies the device from which the call was diverted.
newDestination	Y	Specifies the device to which the call was diverted.
callingDevice	Y	Specifies the device remaining in the call with the newDestination
calledDevice*	Y	The calledDevice is either the originally dialed digits or the internal representation of the originally dialed number (after digit translation) or the DNIS in case of an incoming call. This parameter is only provided in case of Call Forward Immediate.
lastRedirectionDevice	Y	Specifies the previously known redirected from device
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. • Diverting device: Null • Others left in the call: are unaffected
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **NOTE:** All media associated with a connection are considered diverted by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.

Parameter Name	Presented	Comments
connectionInfo	N	Specifies the connection information associated with the diverted connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
callLinkDataList	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Highlighted cause codes need to be re-evaluated after OSCAR CSTA Interface Specification is released.

Cause Code	Diverted Event	Example Reasons for Cause Code
ACD Forward	N	ACD
Busy Overflow	N	Call Forwarding
Calendar Overflow	N	Call Forwarding
Call Forward	Y	Call Forwarding

Cause Code	Diverted Event	Example Reasons for Cause Code
Call Forward - Busy	Y	Call Forwarding
Call Forward - Immediate	Y	Call Forwarding
Call Forward - No Answer	Y	Call Forwarding
Call Not Answered	Y	Recall (Group Device (MLHG) - No answer advance)
Call Pickup	Y	Directed Pickup Call, Group Pickup Call
Capacity Overflow	N	Call Forwarding
Distributed	Y	ACD
Do Not Disturb	N	Call Forwarding (CFW DND not supported)
No Available Agents	Y	ACD
Normal	Y	Any Feature
Overflow	Y	ACD
Park	Y	Park Call (Future) Park to Server
Path Replacement	N	Network Feature
Queue Time Overflow	Y	Call Forwarding (Should be changed to Call Forward)
Queue Night Service	Y	CQ to change Call Forward.
Recall	Y	Recall
Recall – Busy	Y	Recall
Recall – No Answer	Y	Recall
Recall - Forwarded	Y	Recall (Intercept)
Recall – Resources Not Available	N	Recall
Redirected	Y	Deflect Call
Resources Not Available	Y	ACD, Forwarding (Night Service DN unknown)
Unknown Overflow	N	Call Forwarding

OpenScape Voice Operational Notes

- Diverted events are sent to all affected parties in a call. For the Deflect service, for example, there are 2 Diverted events generated—one for the originally called party and one for the calling party.
- Diverted events reflect interworking with SIPQ Call Forwarding scenarios (Unconditional, Busy and No Reply).

4.6.2.8 Established

The Established event indicates that a call has been answered at a device or that a call has been connected to a device.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
established**C**onnection	Y	Specifies the connection that was connected.
answeringDevice	Y	Specifies the device that connected into the call.
callingDevice	Y	Specifies the calling device
calledDevice *	Y	Specifies the called device
lastRedirectionDevice	Y	Specifies the previously known redirected from device
originatingNIDConnection	N	Specifies the connection of the Network Interface Device (NID) that the call originated from.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states for: • Answering device: Connected • Calling device: unaffected and never Null
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Presented	Comments
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered connected by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in the Section 4.1.1.3, “Get Switching Function Capabilities”
EstablishedConnectionInfo	Y	Specifies the connection information associated with the established connection. OpenScape Voice presents the flowDirection information (e.g. silent monitoring and 1-way speaker call). • Transmit&Receive • Receive • Transmit
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Event Causes	Established Event	Example Reasons for Cause Code
ACD Forward	N	ACD
Alternate	Y	Alternate Call
Call Back	Y	Call Back Call-Related
Call Forward	Y	Call Forwarding
Call Forward - Busy	Y	Call Forwarding
Call Forward - Immediate	Y	Call Forwarding
Call Forward - No Answer	Y	Call Forwarding
Call Pickup	Y	Directed Pickup Call, Group Pickup Call
Conference	Y	Conference
Distributed	Y	ACD, Routing Services
Intrude	N	Intrude Call
Key Operation	N	Multiple Appearance
Network Signal	N	External Calls
New Call	Y	Any Feature
No Available Agents	Y	ACD, Forwarding
Normal	Y	Any Feature
Overflow	Y	ACD (Group Device (MLHG) – call distributed to the overflow DN)
Override	N	Intrude Call
Recall	Y	Recall
Recall – Busy	Y	Recall
Recall – No Answer	Y	Recall
Recall - Forwarded	Y	Recall
Recall – Resources Not Available	?	Recall
Redirected	Y	Deflect Call
Remains in Queue	Y	ACD
Resources Not Available	Y	ACD, Forwarding
Single Step Conference	N	Single Step Conference
Single Step Transfer	Y	Single Step Transfer
Timeout	N	External Call

OpenScape Voice Operational Note

EstablishedConnectionInfo is used in silent monitoring and Join call event flows.

4.6.2.9 Failed

The Failed event indicates that a call cannot be completed or a connection has entered the Fail state for any reasons.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
failedConnection	Y	Specifies the connection that failed.
failingDevice	Y	Specifies the device that failed.
callingDevice	Y	Specifies the calling device
calledDevice *	Y	Specifies the called device
lastRedirectionDevice	Y	Specifies the previously known redirected from device
originatingNIDConnection	N	Specifies the connection of the Network Interface Device (NID) that the call originated from.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. For the failing device: Fail For the other devices left in the call: (unaffected)
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Presented	Comments
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered failed by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
failedConnectionInfo	Y	Specifies the connection information associated with the failed connection. OpenScape Voice presents the flowDirection information (e.g. 1-way speaker call) • Transmit&Receive • Receive • Transmit
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Supported Event Causes	Failed Event	Example Reasons for Cause Code
Blocked	Yes	After Single Step Transfer - transferring device is temporarily blocked until the transfer completes beyond the possibility of recall.
Busy	Yes	Connection failed due to busy device.
Call Cancelled	Yes	Calling party abandons (hangs up) after call is diverted from queue to agent before agent is alerted.
Call Not Answered	No	Used in Diverted Event for Recall on No Answer
Destination Not Obtainable	Yes	Media server request for an unregistered subscriber.
Destination Out of Order	Yes	Device is not registered with OpenScape Voice registrar
Do Not Disturb	Yes	Do Not Disturb subscriber feature active on called device
Invalid Number Format	Yes	Digit translation errors
Key Operation	No	Used in Conferenced, Held and Retrieved events in Bridged Call use cases
Network Congestion	Yes	CAC - Resource Management Error - no subscriber re-routing
Network Not Obtainable	Yes	CAC - Subscriber re-routing
Network Signal	No	Network interface device (NNI) used on call
Normal	Yes	Used when a more specific cause can not be provided.
Redirected	Yes*	*While not supported by ECMA this cause is in an ACD event flow when a call distributed to an agent whose phone has local call forwarding set. In this case the call is pulled back to the Hunt Group for re-hunting or application distribution.
Reorder Tone	Yes	Number translation error.
Resources Not Available	Yes	The following cases apply: • In Large Conference if exceeded the Number of members • Accept to an Unavailable subscriber • Forwarding due to unregistered/unreacheable devices • Some Busy-Recall scenarios • Problems with internal resources (e.g. SSAL memory slot not available) • Failed to connect to Media Server (Large Conference)

OpenScape Voice Operational Notes

A complete connection identifier is provided as the failedConnection parameter and the Failed event is reported to all active monitors associated with the call. The switching function does not provide userData with this event, although it is required by the standard.

4.6.2.10 Held

The Held event indicates that a call has been placed on hold.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
heldConnection	Y	Specifies the connection at which the hold was activated.
holdingDevice	Y	Specifies the device at which hold was activated.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call: • Holding device: Hold • Other left in the call: are unaffected.
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM --- **Note:** All media associated with a connection are considered held by OpenScape Voice. ---
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
heldConnectionInfo	Y	Specifies the connection information associated with the held connection. OpenScape Voice presents the flowDirection information: • Transmit&Receive (standard use cases) • Receive (e.g. silent monitoring, one-way speaker call) • Transmit e.g. one-way speaker call)
callLinkData	N	Specifies the correlator data associated with the call.
privateData	Y	Non-standardized information.

Event Causes

Highlighted cause codes need to be re-evaluated after OSCAR CSTA Interface Specification is released.

Event Causes	Held Event	Example Reasons for Cause Code
Alternate	Y	Alternate Call
Conference	Y	Consultation Call with a consultOptions of ConferenceOnly
Consultation	Y	Consultation Call
Key Operation	Y	Bridged Call
Intrude	N	Intrude Call
Maintenance	Y	Maintenance
Network Signal	N	External Call
Normal	Y	Any Feature
Recall	Y	Recall
Suspend	N	Call Clearing
Transfer	Y	Consultation Call with a consultOptions of Transfer Only

OpenScape Voice Operational Notes

None

4.6.2.11 Network Capabilities Changed

Event Not Supported

The Network Capabilities Changed event indicates that a situation occurred during a call's progress in a public or private network that modifies its signaling capability (that is, inter-networking). It does not indicate a change in the connection state of the Network Interface Device (for example, trunk, CO Line) through which the call has accessed the network.

4.6.2.12 Network Reached

The Network Reached event indicates that a call has cut through the switching sub-domain boundary to another network; that is, has reached and engaged a Network Interface Device (for example, trunk, CO Line). This event indicates that there may be a reduced level of event reporting and possibly no additional device feedback, except connection/call clearing, provided for this device in the call due to a lack of network signaling. The level of signaling provided by the network may be indicated by the networkCapability parameter.

Event Parameters

Parameter Name	Presented	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
outboundConnection	Y	Specifies the outbound connection associated with the call that is leaving the switching sub-domain.
networkInterfaceUsed	Y	Specifies the Network Interface Device that was selected. Parameter is always set to “notKnown”
callingDevice	Y	Specifies the calling device
calledDevice *	Y	The calledDevice is either the originally dialed digits or the internal representation of the originally dialed number (after digit translation) or the DNIS in case of an incoming call.
lastRedirectionDevice	Y	Specifies the previously known redirected from device
originatingNIDConnection	N	Specifies the connection of the Network Interface Device (NID) that the call originated from.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call: • Network Interface Device: Connected • Other devices left in the call: are unaffected
networkCapability	N	Specifies the type of network reached and the Call Control events supported by the network.
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.

Parameter Name	Presented	Comments
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** Only specified media is applicable and is determined by the capabilities for the gateway interface.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
outboundConnectionInfo	N	Specifies the connection information associated with the outboundConnection connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Presented	Comments
associatedCalledDevice	N	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
outboundConnectionInfo	N	Specifies the connection information associated with the outbound connection.
callLinkData	N	Specifies the correlator data associated with the call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Event Causes	Network Reached Even	Example Reasons for Cause Code
ACD Forward	N	ACD
Call Forward	Y	Forwarding
Call Forward - Busy	Y	Forwarding
Call Forward - Immediate	Y	Forwarding
Call Forward - No Answer	Y	Forwarding
Conference	Y	Any Conference Feature
Distributed	Y	ACD
No Available Agents	?	ACD, distribution
Normal	Y	Any Features
Overflow	Y	ACD
Redirected	Y	Deflect Call
Resources Not Available	Y	ACD, distributed
Transfer	Y	Transfer

OpenScape Voice Operational Notes

None

4.6.2.13 Offered

The Offered event indicates that the connection is in the Offered mode of the Alerting state. This indicates that a call is in a pre-delivery state.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
offeredConnection	Y	Specifies the connection that is altering (offer mode).
offeredDevice	Y	Specifies the device that is alerting
callingDevice	Y	Specifies the calling device.
calledDevice *	Y	Specifies the originally called device.
lastRedirectionDevice	Y	Specifies the previously known redirected from device.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. • For the alerting device: Alerting • For the calling device: (unaffected)
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.

Parameter Name	Supported	Comments
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in tSection 4.1.1.3, “Get Switching Function Capabilities”.
offeredConnectionInfo	Y	Specifies the connection information associated with the alerting connection. OpenScape Voice presents the flowDirection information (e.g. 1-way speaker call) • Transmit&Receive • Receive • Transmit
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Highlighted cause codes need to be re-evaluated after OSCAR CSTA Interface Specification is released.

Event Causes	Supported	Example Reasons for Cause Code
ACD Busy	N	ACD, Consultation Call
ACD Forward	N	ACD
ACD Saturated	N	ACD, Consultation Call
Call Back	Y	Call Back Call-Related
Call Forward	Y	Call Forwarding
Call Forward—Busy	Y	Call Forwarding
Call Forward—Immediate	Y	Call Forwarding
Call Forward—No Answer	Y	Call Forwarding
Conference	Y	Any Conference Feature
Distributed	Y	ACD, Routing Services
Entering Distribution	Y	ACD, Routing Services
Key Operation	N	Multiple Appearance
Multiple Alerting	Y	Multiple Alerting (Simultaneous Ringing Service)
Network Signal	N	
New Call	Y	Any Feature
No Available Agents	Y	ACD, Forwarding
Normal	Y	Any Feature
Overflow	Y	ACD
Override	N	Intrude Call
Recall	Y	Recall
Recall – Busy	Y	Recall
Recall - No Answer	N	Recall
Recall – Forwarded	Y	Recall
Recall - Resources Not Available	N	Recall
Redirected	Y	Deflect Call
Remains in Queue	Y	ACD, Queuing, Single Step Conference, Join Call
Resources Not Available	Y	ACD, Forwarding
Single Step Transfer	Y	Single Step Transfer
Single Step Conference	N	Single Step Conference
Timeout	N	External Calls

OpenScape Voice Operational Notes

1. This event is flowed by the OpenScape Voice when a call reaches a monitored ONS Subscriber. Internally, the call is in a suspended state waiting for the application to operate on the call via a Deflect Call, Accept Call or Clear Connection.
2. The Offered event will not be generated in the case of SS Transfer or Transfer. While generated for consultation call, it will not be generated for consultation transfer.
3. Offered is not supported for MLHG pilot since ONS-IO is currently not supported for MLHG pilots.
4. If the monitored ONS subscriber is involved in one or more calls the Offered event will still be generated.
5. The call forward-dependable or call forwarding-immediate switching function service will be applied after the Accept Call service but before the device is alerted.
6. The application may suppress ONS Inbound by filtering the Offered event at the time the monitor is started for an ONS subscriber DN. Inbound calls are treated as though the Offered Event times out immediately. The call proceeds to the registering device (if any) and may be affected by other feature interactions such as call forwarding.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.6.2.14 Originated

The Originated event indicates that a call is being attempted from a device. It implies that input activity for the call is complete and that a call (rather than a feature) has been requested.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
originatedConnection	Y	Specifies the connection at which the call originated.
callingDevice	Y	For internal or outgoing calls the callingDevice parameter includes the Switching Function Representation of the calling device, for incoming calls the callingDevice parameter may include the Automatic Number Identification (ANI)
calledDevice *	Y	The calledDevice is the originally dialed digits.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. For the device initiating the call: Connected
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Supported	Comments
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered originated for the call by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
originatedConnectionInfo	Y	Specifies the connection information associated with the originated connection. OpenScape Voice presents the flowDirection information (e.g. 1-way speaker call) • Transmit&Receive • Receive • Transmit
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Highlighted cause codes need to be re-evaluated after OSCAR CSTA Interface Specification is released.

Event Causes	Supported	Example Reasons for Cause Code
Call Back	Y	Call Back Non-Call-Related
Conference	N	Consultation Call with a consultOptions of ConferenceOnly
Consultation	N	Consultation Call
Make Call	N	Make Call without
New Call	Y	Any Feature
Normal	Y	Any Feature, Make Call
Transfer	N	Consultation Call with a consultOptions of TransferOnly

OpenScape Voice Operational Note

The switching function does not provide the Originated event cases where a connection immediately reports failed.

4.6.2.15 Queued

The Queued event indicates that a call has been queued.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
queuedConnection	Y	Specifies the queued connection.
queue	Y	Specifies the queue device. The device ID may be represented by Switching Function Representation or Device Number.
callingDevice	Y	For internal or outgoing calls the callingDevice parameter includes the Switching Function Representation of the calling device, for incoming calls the callingDevice parameter may include the Automatic Number Identification (ANI)
calledDevice *	Y	The calledDevice is either the originally dialed digits or the internal representation of the originally dialed number (after digit translation) or the DNIS in case of an incoming call.
lastRedirectionDevice	Y	Specifies the previously known redirected from device
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. For the queue device: Queued For the other devices left in the call: (unaffected)
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Supported	Comments
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice only
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description inSection 4.1.1.3, “Get Switching Function Capabilities”
initiatedConnectionInfo	N	Specifies the connection information associated with the initiated connection.
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

* If the connection was redirected from a virtual subscriber (Remote Call Forwarding - RCF) device then the calledDevice will be presented as virtual subscriber DN. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Highlighted cause codes need to be re-evaluated after OSCAR CSTA Interface Specification is released.

Cause Codes	Queued Event	Example Reasons for Cause Code
Busy	Y	Make Call, Consultation Call, Deflect, Single-Step Transfer Call, Single-Step Conference Call
Call Forward	Y	Call Forwarding
Call Forward—Busy	Y	Call Forwarding
Call Forward—Immediate	Y	Call Forwarding

Cause Codes	Queued Event	Example Reasons for Cause Code
Call Forward—No Answer	Y	Call Forwarding
Camp On	N	Camp On Call (no queued event supported for endpoints. All calls delivered)
Camp On Trunks	N	External Call, Camp On Call
Distribution Delay	Y	ACD, queuing (Call queued and no members in the group are busy or Working after call.)
Do Not Disturb	N	Forwarding
Multiple Queuing	N	Multiple Queuing
Network Congestion	Y	External Call
Network Not Obtainable	N	External Call
Network Signal	N	External Call
No Available Agents	Y	ACD
Normal	Y	Any feature
Overflow	Y	ACD, queuing (Call distributed from group device to overflow destination)
Park	Y	Park Call (Future) Park to Server
Recall	Y	Recall
Recall – Busy	N	Recall
Recall - No Answer	N	Recall
Recall – Forwarded	N	Recall
Recall - Resources Not Available	N	Recall
Redirected	Y	Deflect
Remains in Queue	Y	ACD, Queuing, Single Step Conference, Join Call
Resources Not Available	Y	ACD
Trunks Busy	N	External Call

OpenScape Voice Operational Notes

The queued event is currently only provided for Group Devices only, not Station Devices, for example. no call waiting.

4.6.2.16 Retrieved

The Retrieved event indicates that a previously held call has been retrieved.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
retrievedConnection	Y	Specifies the connection at which hold was deactivated.
retrievingDevice	Y	Specifies the device at which hold was deactivated.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. For the retrieving device: Connected For the other devices left in the call: (unaffected)
cause	Y	The cause parameter specifies the reason for the event.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Supported	Comments
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered retrieved by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, "Get Switching Function Capabilities".
retrievedConnectionInfo	Y	Specifies the connection information associated with the alerting connection. OpenScape Voice presents the flowDirection information (e.g. 1-way speaker call) • Transmit&Receive • Receive • Transmit
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information.

Event Causes

Cause Codes	Retrieved Event	Example Reasons for Cause Code
Alternate	Y	Alternate Call
Key Operation	Y	Bridged Call
Network Signal	N	External Call
Normal	Y	Any feature, Alternate Call, Reconnect Call, Retrieve Call
Recall	Y	Recall

OpenScape Voice Operational Notes

None

4.6.2.17 Service Initiated

The Service Initiated event indicates that a telephony service has been initiated at a monitored device. This event indicates that either a call may be originated or a feature may be invoked. This event also may indicate that a device is prompting a user.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
initiatedConnection	Y	Specifies the connection at which service was initiated.
initiatingDevice	Y	Specifies the initiating device.
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. When the device is initiating a service of some form: Initiated
cause	Y	The cause parameter specifies the reason for the events
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.

Parameter Name	Supported	Comments
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered initiated by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
initiatedConnectionInfo	N	Specifies the connection information associated with the initiated connection.
callLinkData	N	Specifies the correlator data associated with the call.
subjectOfCall	N	Specifies the subject/intent of the call.
messageInfo	N	Specifies the contents of message information associated with a call.
privateData	Y	Non-standardized information. • callbackTarget when prompting is for callback recall.

Event Causes

Cause Code	OpenScape Voice	Example Reasons for Cause Code
Active Participation	Y	Join Call with a participationType of Active (prompting)
Call Back	Y	Call Back Call-Related, Call Back Non-Call-Related
Call Pickup	Y	Directed Pickup, Group Pickup (prompting)
Conference	Y	Consultation Call with a consultOptions of ConferenceOnly
Consultation	Y	Consultation Call
Join Call	Y	Join Call (prompting)
Make Call	Y	Make Call (prompting)
Make Predictive call	N	Make Predictive Call
New Call	Y	Any Feature
Normal	Y	Any Feature

Cause Code	OpenScape Voice	Example Reasons for Cause Code
Reserved	N	Make Predictive Call, incoming call
Silent Participation	Y	Join Call with a participationType of Silent (prompting)
Transfer	Y	Consultation Call with a consultOptions of TransferOnly

Miscellaneous Characteristics

Service initiated shall be provided for prompting is supported.

OpenScape Voice Operational Notes

- Some CSTA services (Make Call and Call Back) may require prompting the user of the targeted device in order to take that device off-hook. In this case a Service Initiated event is generated containing the appropriate cause code (Make Call or Call Back).
- Off-Hook" status of the physical SIP device is not detected by the OpenScape Voice call process. OpenScape Voice sends the service initiated after address translation.
- In the case of a Callback Recall this event provides the callback target device in privateData. The target device number is presented as it appears on the phone.

Note: No name display is provided.

Note: A new ECMA contribution is being considered which adds the "calledDevice" parameter to this event. This change may be added in a future release.

4.6.2.18 Transferred

The Transferred event indicates that an existing call has been transferred to another device and the transferring device has been dropped from the call. The transferring device does not appear in any future events for the call.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
primaryOldCall	Y	The switching function provides the local view option. The primaryOldCall specifies the held call at the transferring device, otherwise at other participating devices it is the only call involved in the transfer from the perspective of that device.
secondaryOldCall	Y	The switching function provides the local view option. The secondaryOldCall specifies the active call at the transferring device, otherwise it is not provided.
transferringDevice	Y	Specifies the device that transferred the call.
transferredToDevice *	Y	Specifies the transferred- to device. * See footnote.
transferredConnections	Y	For the transferring device the transferredConnections parameter is a list that contains the new ConnectionIDs and the old ConnectionIDs of the transfer and for externally located devices the associated Network Interface DeviceID. For the other participating devices the old ConnectionID that does not belong to the device is not be provided. The endPoint DeviceID parameter is provided only for external calls with network information. It is the representation of the externally located device. The resultingConnectionInformation flowDirection is provided (e.g., silent monitoring).
localConnectionInfo	Y	Specifies the local connection state of the device associated with the Monitor Cross Reference ID. The following are the states of the devices in the call. For the transferring device (any Connection IDs associated with the transfer, that is, this event should be used for both single and multi-step transfers.): Null For the other devices associated with the transfer: (unaffected)
cause	Y	The cause parameter specifies the reason for the event.
networkCallingDevice	N	Specifies the original calling device information provided by the network for external incoming calls.

Parameter Name	Supported	Comments
networkCalledDevice	N	Specifies the original called device information provided by the network for external incoming calls.
associatedCallingDevice	Y	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is mandatory for all external incoming calls and shall not be provided otherwise. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
associatedCalledDevice	Y	For outgoing external calls, this parameter specifies the Network Interface Device associated with the called device. For incoming external calls, this parameter specifies a device within the switching sub-domain associated with the originally called device. This parameter is mandatory for all external outgoing calls and it is optional for external incoming calls. Parameter not provided if calling and calling device are internal. Not a call involving a gateway. Parameter set to “notKnown” for external incoming or outgoing calls. Calls where a gateway is used.
mediaCallCharacteristics	Y	This specifies the media characteristics to be associated with the call being made. If this parameter is not present then the media class is Voice. Supported values: • Voice • Image • IM **Note:** All media associated with a connection are considered transferred by OpenScape Voice.
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description in Section 4.1.1.3, “Get Switching Function Capabilities”.
callLinkData	N	Specifies the correlator data associated with the call.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
privateData	Y	Non-standardized information.

* If the transferredTo device is a virtual subscriber (Remote Call Forwarding - RCF) then the transferToDevice will be presented as the forwarding target provisioned on the RCF. Refer to MLHG and RCF event flows in CSTA Call Scenarios for additional details.

Event Causes

Cause Codes	Transferred Event	Example Reasons for Cause Code
Network Signal	N	External Call
Normal	Y	Transfer
Path Replacement	Y	SIP and SIP-Q Network Feature
Single Step Transfer	Y	Single Step Transfer
Transfer	Y	Transfer Call, Two Step Transfer

Miscellaneous Characteristics

Local view shall be provided.

OpenScape Voice Operational Notes

None

4.7 Call Associated Features

4.7.1 Services

4.7.1.1 Associate Data

Service Not Supported

The Associate Data service associates computing function information (such as correlator data, account code, authorization code, call qualifying data, call characteristics, subject of call, language preference, and so on) with a specified call.

4.7.1.2 Cancel Telephone Tones

Service Not Supported

The Cancel Telephony Tones service cancels a telephony tone that is being sent on a connection by the Generate Telephony Tones service.

4.7.1.3 Change Connection Information

The Change Connection Information service allows an application to change the connection information associated with a specified connection.

Service Request Parameters

Parameter Name	Supported	Description
connectionToBeChanged	Y	Specifies the connectionID whose connection information is to be changed.
requestedConnectionInfo	Y	Specifies the requested connection information. This information includes the flow direction, number of channels, and the media session information. Supported values: • Voice • Image • IM See usage notes.

Response Parameters

Parameter Name	Supported	Description
actualConnectionInfo	Y	Specifies the actual connection information that is associated with the connection.

OpenScape Voice Operational Notes

- For OpenScape Voice IP Centrex Client, only media session information is supported which contains “voice”, image”, and/or “im”.
- OpenScape Voice defines Media session information as Character with the following possible strings: “voice”, “image”, “im”.
- IM mediaConnection calls are treated as separate from voice and image.
- This service may be used to change the media type of an existing call voice of video call. For example;
  - Promoting a voice only call to voice & image (video call)
  - Demoting a voice & image call to voice only
- ONS-IO only supports voice media connections.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

4.7.1.4 Generate Digits

The Generate Digits service causes a series of digits to be sent on behalf of a connection in a call. The digits may be sent in the form of DTMF. This service also supports optional Parameters to control digit generation. This service is used for generating end-to-end information that is to be sent to a device in a call (that is, not to address/select a device).

This service does not affect the state or progress of a call.

Service Request Parameters

Parameter Name	Supported	Comments
connectionToSendDigits	Y	Connection of the device which is generating the digits for the call.
digitMode	Y	Specifies the signaling format. The complete set of possible values is: DTMF – DTMF Signaling (default)
charactersToSend	Y	Specifies the string of characters to send. Shall consist of the following set: • DTMF digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, #, **Note:** MF digits A, B, C, D are not supported. A comma "," may be included in the parameter string to indicate a pause between characters. The length of the pause is switching function specific and may be deter mined using the capabilities exchange services. This parameter type is a character string. The maximum length supported by the switching function is provided using the capabilities exchange services. **Note:** The ampersand ("&") may be used by the application to cause the immediate release of Media Server resource. In the case were uaCSTA Generate Digit services are provided by the "&" is ignored by the phone.

Response Parameters

None

Miscellaneous Characteristics

Pause tone character of "," supported.

OpenScape Voice Operational Notes

- The charactersToSend string is limited to 32 characters.
- The connection state of both devices in the call must be connected.
- After digit generation has commenced, it cannot be interrupted.
- Successive requests to generate digits is rejected until the active request is complete.
- Only DTMF mode is supported
- Valid characters for DTMF mode are ‘0’ through ‘9’,’*’,’#’, and’,’ (comma). A comma injects a 2 second delay between the signaling of the previous and next digits it separates. Multiple commas can be used to inject longer pauses.
- The duration of DTMF digits and interdigit spacing is determined by the platform media server service.
- When OpenScape Voice provides digit generation using the platform’s media service the media sever resource is retained for 3 seconds. During this interval, only ClearConnection and GenerateDigits requests are permitted. The application may request OpenScape Voice to immediately release the media server resources by including an ampersand (“&”) character within the charactersToSend string.
- If the target device is a SIP phone that supports uaCSTA, OpenScape Voice may use uaCSTA to generate digits from the device. The CSTA application has no control if uaCSTA is used or not.

4.7.1.5 Generate Telephony Tones

Service Not Supported

The Generate Telephony Tones service causes a telephony tone such as a beep, busy, or ringback to be sent on behalf of a connection in a call. This service also supports optional parameters to control tone generation.

4.7.1.6 Send User Information

Service Not Supported

The Send User Information service is used to send user data information.

4.7.2 Events

4.7.2.1 Call Information

The Call Information event indicates that call associated information has been collected/updated for a call.

Event Parameters

Parameter Name	Supported	Description
monitorCrossRefID	Y	Associates the event to an established monitor.
connection	Y	Indicates the connection of the device responsible for associating the information with the call.
device	Y	Indicates the device responsible for associating the information with the call.
accountCode	N	Specifies the account code to associate with the consulted call.
authCode	N	Specifies the authorization code to allow the call.
servicesPermitted	Y	Specifies a list of the call control services that can be applied to the local connection.
connectionInfo	Y	Indicates the connection information associated with the connection. Supported values: • Voice • Image • IM
callCharacteristics	Y	Specifies the characteristics that the switching function reports using the callCharacteristics parameter. Refer to callCharacteristicsSupported parameter description inSection 4.1.1.3, “Get Switching Function Capabilities”.
callLinkData	N	Specifies the correlator data associated with the call.
deviceInfo	N	Specifies the device information (for example, name) that has been associated with the connection.
privateData	Y	Non-standardized information.

Event Causes

None

OpenScape Voice Operational Notes

The mediaSessionInfo parameter is defined as a string and is encoded for voice, video, and/IM media as follows:

#	Scenario	ConnectionInfo		
		Voice	Image	IM
1	Video has been added to an existing Audio call on the device	ü	+ Added	n/a
2	Video has been removed from an existing video call on the device	ü	- Removed	n/a
3	Audio has been add to an existing Video only on the device	+ Added	ü	n/a
4	Audio has been removed an existing Video Call on the device	- Removed	ü	n/a

- IM is supported only in a separate connection.

4.7.2.2 Charging

Event Not Supported

The Charging event indicates that new call charging information (such as a network provided Periodic Pulse Metering (PPM) signal) has been detected for a device involved in a call. This event may occur after the call has been released, to report arrival of additional call charge information.

4.7.2.3 Digits Generated

The Digits Generated event indicates that DTMF digits have been generated at a device.

OpenScape Voice sends this event after Generate Digits service is successfully executed.

Event Parameters

Parameter Name	Supported	Comments
MonitorCrossRefID	Y	Associates the event to an established monitor.
connection	Y	The connection at the device
digitGeneratedList	Y	The sequence of digits generated. For DTMF digits, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, # are supported. This parameter only includes previously unreported digits.

Event Causes

None

OpenScape Voice Operational Note

Refer to notes on Generate Digits for special handling.

4.7.2.4 Telephony Tones Generated

Event Not Supported

The Telephony Tones Generated event indicates that telephony tones have been generated at a device. Common situations that generate this event include; The switching function generates telephony tones (using the Generate Telephony Tones service) for the device of a given connection.

4.7.2.5 Service Completion Failure

Event Not Supported

The Service Completion Failure event indicates that a previous multi-step computing function initiated service request (as indicated by the switching function in the capabilities exchange services) has failed before that service's successful completion conditions were satisfied.

4.8 Media Attached Services

Service Not Supported

A computing function making use of both call control services and media services needs to establish sessions with both services, attach calls to the media service, and needs a way of associating the identifiers (e.g., Connection Identifiers, Media Stream Identifiers) used by the two services. This Standard defines a set of services, called media attachment services, that make these tasks significantly easier for the computing function.

4.9 Routing Services

Service Not Supported

If the switching function supports the Route Registration services, then the computing function shall use these services to register as a routing server before it can route calls. If the switching function does not support the Route Registration services, then the computing function may receive route service requests for any routing device at any time.

4.10 Physical Device Features

4.10.1 Services

This section describes the supported CSTA Physical Device features. Physical device features are only supported by uaCSTA-enabled SIP phones such as OpenStage/

OpenScape Voice does **not support** the following physical device services:

- Button Press
- Get Auditory Apparatus Information
- Get Button Information
- Get Display
- Get Hookswitch Status
- Get Lamp Information
- Get Lamp Mode
- Get Microphone Gain
- Get Ringer Status
- Get Speaker Mute
- Set Button Information
- Set Display
- Set Hookswitch Status
- Set Lamp Mode
- Set Message Waiting Indicator
- Set Microphone Gain
- Set Ringer Status
- Set Speaker Mute

4.10.1.1 Get Message Waiting Indicator

The Get Message Waiting Indicator (MWI) service provides the message waiting feature status at a specified device. The message waiting feature is typically used to notify a user (typically using a dedicated lamp on a phone device) when messages are available.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the device's physical element.

Response Parameters

Parameter Name	Supported	Comments
messageWaitingOn	Y	Specifies the value (True / False) of the requested feature. Supported values: • FALSE – Message waiting is off • TRUE – Message waiting is on
deviceForMessage	N	Specifies the device where the message is waiting.

OpenScape Voice Operational Notes

- OpenScape Voice does not currently support the Set Message Wait Service.
- The Message Waiting event is flowed by OpenScape Voice when a subscriber with voice messaging service is notified by the service of a change in MWI state.

4.10.1.2 Get Microphone Mute

The Get Microphone Mute Service provides the Mute status of a specified microphone at a specified device.

Service Request Parameters

Parameter Name	Supported	Comments
Device	Y	Specifies the device's physical element. The device provided here must be a SIP endpoint
auditoryApparatus	Y	Specifies the auditory apparatus to query. If not provided, then information is obtained on all apparatuses associated with the device.

Response Parameters

Parameter Name	Supported	Comments
microphoneMuteList	Y	Specifies information about the specified auditory apparatus or about all auditory apparatuses associated with the device if no auditoryApparatus was provided in the request. Supported options: • auditoryApparatus • microphoneMuteOn – TRUE – microphone muted – FALSE – microphone activated

OpenScape Voice Operational Notes

- This service is only supported for SIP phones that register with SIMPLE uaCSTA capability.
- The auditoryApparatus is optional. If provided the value should be set to "1". Either option results in a list of status for all microphones being returned. Other values results in an error being returned.

4.10.1.3 Get Speaker Volume

The Get Speaker Volume Service provides the volume of a specified speaker at a specified device.

Service Request Parameters

Parameter Name	Supported	Comments
Device	Y	Specifies the device's physical element.
auditoryApparatus	Y	Specifies the auditory apparatus to query. If not provided, then information is obtained on all apparatuses associated with the device.

Response Parameters

Parameter Name	Supported	Comments
speakerVolumeList	Y	Specifies information about the specified auditory apparatus or about all auditory apparatuses associated with the device if no auditoryApparatus was provided in the request. Supported options: • auditoryApparatus • speakerVolAbs – A value of 0-100 where 0 indicates no volume and 100 indicates maximum volume

OpenScape Voice Operational Notes

- This service is only supported for SIP phones that register with SIMPLE uaCSTA capability.
- On the request, auditoryApparatus can be either "1" or can be absent. Both result in the status of the current active speaker being returned.

4.10.1.4 Set Microphone Mute

The Set Microphone Mute Service sets or clears the Mute status of a specified microphone at a specified device. When the Mute feature is activated at this device, no audio is transmitted using the microphone. This feature is used when it is desired to prevent the other parties in a call from hearing a conversation through the device.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the device's physical element.
auditoryApparatus	Y	Specifies the auditory apparatus to query. Must be "1" indicating all microphones.
microphoneMuteList	Y	Specifies the microphone mute setting of a particular microphone. • microphoneMuteOn – TRUE – mute microphone – FALSE – activate microphone

Response Parameters

None

OpenScape Voice Operational Notes

- This service is only supported for SIP phones that register with SIMPLE uaCSTA capability.
- On the request, auditoryApparatus must be "1" indicating all microphones.

4.10.1.5 Set Speaker Volume

The Set Speaker Volume Service sets the volume of the specified speaker at a specified device.

While a device's microphone is muted, no audio information is transmitted over the microphone. This is used when it is desired to prevent the other device(s) in a call from hearing a conversation.

Service Request Parameters

Parameter Name	Supported	Comments
Device	Y	Specifies the device's physical element.
auditoryApparatus	Y	Specifies the auditory apparatus to query. Must be "1" indicating the current active speaker.
speakerVolume	Y	Specifies the speaker volume as an absolute value or that the volume should be incremented or decremented by a switch specified increment. • speakerVol – 0-100 OR • speakerVol – increment – decrement

Response Parameters

None

OpenScape Voice Operational Notes

- This service is only supported for SIP phones that register with SIMPLE uaCSTA capability.
- On the request, auditoryApparatus must be "1" indicating the current active speaker. If speakerVolInc is used, the increment or decrement level is determined by the phone.

4.10.2 Events

This section describes the supported CSTA Physical Device Events.

OpenScape Voice does **not support** the following physical device feature events:

- Button Information
- Button Press
- Display Updated
- Hookswitch
- Lamp Mode
- Microphone Gain
- Microphone Mute
- Ringer Status
- Speaker Mute
- Speaker Volume

4.10.2.1 Message Waiting

The Message Waiting event indicates that the message waiting status has been changed for a device.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
targetDevice	Y	Specifies the device where the message waiting feature has changed.
messageWaitingOn	Y	Specifies the setting of the message waiting feature. Supported values: • FALSE - Message waiting is off. • TRUE – Message waiting is on.

Event Causes

None

OpenScape Voice Operational Note

The Message Waiting event is sent when a subscriber provisioned for voice messaging and the messaging service updates the MWI status. OpenScape Voice supports SIP Blind NOTIFY for MWI sent from SIP voice messaging servers' service to the subscriber DN. Refer to the *OpenScape Voice Security Checklist*.

4.11 Logical Device Feature Services

4.11.1 Services

This section describes the supported CSTA Logical Device Services.

OpenScape Voice does not support the following physical device services:

- Call Back Message Non-Call-Related
- Cancel Call Back Message
- Get Auto Answer
- Get Auto Work Mode
- Get CallBack (ECMA 269 edition 7)
- Get Caller ID Status
- Get Last Number Dialed
- Get Routing Mode
- Set Auto Answer
- Set Auto Work Mode
- Set Caller ID Status
- Set Routing Mode

4.11.1.1 Call Back Non-Call Related

The Call Back Non-Call-Related service allows a computing function to request that the switching function originate a call back call between two devices.

As an example, the service might be used when a device is busy so that a call between an originating device and a target device can be attempted when a device becomes free.

Service Request Parameters

Parameter Name	Supported	Comments
originatingDevice	Y	Specifies the originating device for the call back call.
targetDevice	Y	Specifies the target device for the call back call. Only last called deviceID or the string “CCB” is supported. (See operational notes).

Response Parameters

None

OpenScape Voice Operational Notes

- The Call Back Non-Call Related service only supports a targetDevice equal to the last called number. A service request where the targetDevice does not equal (after translation) the last saved dialed number or a previously set Call Back will be rejected with CSTA errorvalue= requestIncompatibleWithDevice.
- A hardcoded tragetDevice “CCB” may be used by applications to simplify the call back non-call related service invocation.

4.11.1.2 Cancel Call Back

The Cancel Call Back service allows the computing function to cancel a previous (or all) Call Back feature at a device. Note that this service cancels call backs that were created with either call related or non-call related Call Back features.

Service Request Parameters

Parameter Name	Supported	Comments
originatingDevice	Y	DeviceID of the device who initiated the original Call Back service (call or non-call related)
targetDevice	Y	The DeviceID of the target of the original Call Back service. If the switching function supports clearing of all Call Back features (as indicated by the capability exchange services) and a null format DeviceID (a DeviceID with 0 characters) is provided, all of the Call Back features at the originatingDevice are cancelled. OpenScape Voice supports both methods of call back cancellation.

Response Parameters

None

OpenScape Voice Operational Notes

- OpenScape Voice supports two methods of canceling callback originated by the originatingDevice:
  - Cancel specific call back when the targetDevice = valid deviceID in the callback list
  - All call backs when the targetDevice has 0 characters.
- In the case of cancel all, if a callback is in the process of recalling or being established, these are not cancelled.

4.11.1.3 Get Agent State

The Get Agent State service provides the agent state at a specified device.

Note that the agent may only be associated with one device.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the DeviceID of the device on which the agent state is being queried.

Response Parameters

<table>
<tr><th>Parameter Name</th><th>Support</th><th colspan="3">Comments</th></tr>
<tr><td rowspan="6">agentStateList</td><td rowspan="6">Y</td><td colspan="3">This parameter specifies a list of agent identifies and / or their corresponding agent state for a given device. Supported parameters:</td></tr>
<tr><td>Parameter</td><td>Support</td><td>Values</td></tr>
<tr><td>agentID</td><td>Y</td><td>DeviceID</td></tr>
<tr><td>loggedOnState</td><td>Y</td><td>• TRUE = logged on
• FALSE = not logged
NOTE: For agents (multi-line hunt group members with the attendant classmark) in hunt groups managed by OpenScape Voice this is always set to TRUE.</td></tr>
<tr><td>acdGroup</td><td>Y</td><td>The acdGroup is provided if the agent is busy with a hunt group call.</td></tr>
<tr><td>agentState</td><td>Y</td><td>Supported States:
• Ready
• Not Ready
• Busy
• Null
• Working After Call</td></tr>
<tr><td>pendingAgentState</td><td>Y</td><td>Indicates pending state if agentState is Busy or Working After Call. This component shall be provided if the switching function is delaying the transition to the pendingAgentState until the agent is no longer Busy or Working After Call, otherwise the parameter is optional.
Supported states:
• Working After Call
• Not Ready
• Ready
• Null.</td></tr>
</table>

OpenScape Voice Operational Notes

- Agent states Not Ready, Ready and Working after Call depends on proper provisioning of MHLG. Refer to Section 3.2.3, “MLHG Pilot (Group Device / ACD) and Agent BGLs” for details.
- Agent Busy state applies any agent direct call (inbound or outbound) or call distributed to an agent from the MLHG.
- See Part II, Appendix A, “CSTA Call Scenarios”, for usage notes.

4.11.1.4 Set Agent State

The Set Agent State service requests a new agent state at a specified device.

In the case where an agent is involved with a call, the transition to the requested state may or may not occur until the current connection transitions to the null state.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the DeviceID for the agent for which the state is to be changed.
requestedAgentState	Y	Specifies the requested agent state. Currently supported values are • Ready • NotReady.
agentID	N	Specifies the agent identifier.
password	N	Specifies the agent password. This parameter can only be provided when the requestedAgentState is loggedOn or loggedOff.
group	N	Specifies the agent ACD group that the agent is logging in or out of.

Response Parameters

Parameter Name	Supported	Comments
pendingAgentState	Y	Indicates the agent state that the agent may transition to after the agent state is no longer Busy or Working After Call. Supported values: • workingAfterCall • notReady • ready

Miscellaneous Characteristics

Description	Supported
Switching function allows a group (ACD group) device in the service request (that is service applies to all agent in ACD group).	Y
Switching function allows an ACD device in the service request (that is service applies to all agents associated with the ACD device)	Y
Switching function delays transition to the requestedAgentState if it is Busy (that is supports the pending agent state)	Y

OpenScape Voice Operational Notes

- Agent states Busy and Working After Call depend on proper provisioning of MHLG. Refer to Section 3.2.3, “MLHG Pilot (Group Device / ACD) and Agent BGLs” for details.
- Agent Busy state applies any agent direct call (inbound or outbound) or call distributed to an agent from the MLHG.
- See Part II, Appendix A, “CSTA Call Scenarios”, for usage notes.

4.11.1.5 Get Do Not Disturb

The Get Do Not Disturb service provides the do not disturb feature status at a specified device. The do not disturb feature is used to prevent incoming calls at a device.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the DeviceID of the device on which the do not disturb feature is being queried.

Response Parameters

Parameter Name	Supported	Comments
doNotDisturbOn	Y	Specifies the value of the requested feature. Supported values: • TRUE – Do Not Disturb is active • FALSE – Do Not Disturb is inactive.

OpenScape Voice Operational Notes

- If the device is an internal MLHG (Hunt Group) the Get DND service may be used to provide status of the Night Service overflow for the group.
- To synchronize OpenScape Voice centralized Call Forwarding with an OpenStage the CSTA device category must be set to “CSTA over SIP”.

4.11.1.6 Set Do Not Disturb

The Set Do Not Disturb service allows the computing function to control the do not disturb feature at a specified device. The do not disturb feature is typically used to prevent a specified device from being alerted.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the DeviceID of the device on which the do not disturb feature is to be set
doNotDisturbOn	Y	Specifies the value of the requested feature. Supported values: • TRUE – Do Not Disturb is active • FALSE – Do Not Disturb is inactive.

Response Parameters

None

OpenScape Voice Operational Notes

- Subscriber DN must be provisioned with DND service.
- If the device is an internal MLHG (Hunt Group) the Set DND service may be used to activate or deactivate Night Service overflow for the group.
- To synchronize OpenScape Voice centralized Do Not Disturb status with an OpenStage device, the CSTA device category must be set to “CSTA over SIP”.

4.11.1.7 Get Forwarding

The Get Forwarding service provides the forwarding feature indication for a specified device. The status returned may consist of one or more forwarding types that are active at the specified device based on user defined conditions. The forwarding feature is used to redirect calls that arrive at a specified device to an alternate destination.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the device on which to query.

Response Parameters

<table>
<tr><th>Parameter Name</th><th>Supported</th><th colspan="3">Comments</th></tr>
<tr><td rowspan="7">forwardList</td><td rowspan="7">Y</td><td colspan="3">This list contains one structure per forwardingType/ forwardDN combination. Supported values:</td></tr>
<tr><td>Parameter</td><td>Supported</td><td>Values</td></tr>
<tr><td>forwardingType</td><td>Y</td><td>• forwardImmediate
• fowardBusy
• fowardNoAns</td></tr>
<tr><td>forward Status</td><td>Y</td><td>• TRUE = forwarding is active
• FALSE = forwarding is inactive</td></tr>
<tr><td>forwardTo</td><td>Y</td><td>DeviceID</td></tr>
<tr><td>fowardDefault</td><td>N</td><td>n/a</td></tr>
<tr><td>ringCount</td><td>N</td><td>n/a</td></tr>
<tr><td>ringDuration</td><td>N</td><td>n/a</td></tr>
</table>

OpenScape Voice Operational Notes

- CSTA exposes OpenScape Voice Call Forwarding status for Immediate, No Answer and Busy variants only.
- To synchronize OpenScape Voice centralized Call Forwarding with an OpenStage device, the CSTA device category must be set to “CSTA over SIP”.

4.11.1.8 Set Forwarding

The Set Forwarding service allows the computing function to control the forwarding feature at a specified device based on user defined conditions. The forwarding feature is used to redirect calls that arrive at a specified device to an alternate destination. This service allows only one user-specified setting (forwarding type/forward-destination combination) to be changed per service invocation.

Service Request Parameters

Parameter Name	Supported	Comments
device	Y	Specifies the device on which to set the feature.
forwardingType	Y	Specifies the type of forwarding. Supported values: • forwardImmediate • fowardBusy • fowardNoAns
activateForward	Y	Indicates the status of the forwarding type. Supported values: • True: Activate forwarding • False: Deactivate forwarding
forwardDN	Y	Specifies the device to which new calls are forwarded. This parameter shall be provided for variable forwarding settings when activateForward is set to TRUE or is optional if set to FALSE.
ringCount	N	Specifies the number of times a device should ring prior to forwarding no answer.
ringDuration	N	Specifies the time (in seconds) that the device should ring prior to forwarding no answer. The ringDuration is not be provided if ringCount is provided.

Response Parameters

None

OpenScape Voice Operational Notes

- CSTA exposes OpenScape Voice Call Forwarding activation / deactivation for Immediate, No Answer and Busy variants only.
- To synchronize OpenScape Voice centralized Call Forwarding with an OpenStage device, the CSTA device category must be set to “CSTA over SIP”.

4.11.2 Events

This section describes the supported CSTA Logical Device Events.

OpenScape Voice does **not support** the following physical device feature events:

- Agent Logged On
- Agent Logged Off
- Auto Answer
- Auto Work Mode
- Call Back Message
- Caller ID Status
- Routing Mode

4.11.2.1 Agent Busy

The Agent Busy event indicates that an agent has entered the Busy state. In this state an agent is involved with an existing call at a device, even if that call is on hold at the device.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
agentDevice	Y	Indicates the device ID at which the agent entered the Agent Busy state.
pendingAgentState	Y	Indicates the agent state that the agent transitions to after the agent state is no longer Busy. Supported states: • Working After Call • Not Ready • Ready • Null.
agentID	N	Indicates the agent identifier.
acdGroup	Y	Indicates the ACD group, if call was distributed from MLHG.
cause	Y	Indicates a reason for the event.

Event Causes

Cause code = Normal.

OpenScape Voice Operational Note

- Agent Busy state applies any agent direct call (inbound or outbound) or call distributed to an agent from the MLHG
- See Part II, Appendix A, “CSTA Call Scenarios”, for more information.

4.11.2.2 Agent Not Ready

The Agent Not Ready event indicates that an agent has entered the Agent Not Ready state. While in this state an agent may receive calls that are not distributed from an associated group device.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
agentDevice	Y	The DeviceID specifies the directory number of the agent device that is Not Ready.
agentID	N	Indicates the agent identifier.
acdGroup	N	Indicates the ACD group. Agent is Not Ready for all groups where it is a member.
cause	Y	Indicates a reason for the event. Always Normal.

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- Agent Not Ready event depends on proper provisioning of MHLG for Hunt Make Busy capability. Refer to Section 3.2.3, “MLHG Pilot (Group Device / ACD) and Agent BGLs” for details.
- Typical examples of when this event may be generated are:
  - The agent invokes the Hunt Make Busy ON feature on the telephone. The subscriber requires explicit access to this feature at the device level using MLHG member configuration.
  - The agent invokes Set Agent State service with requested state Not Ready. The subscriber requires explicit access to this feature at the device level using MLHG member configuration.
  - The agent becomes not ready using the Auto Busy feature. If this feature is active, the agent is made Not Ready by OpenScape Voice if the agent does not answer distributed calls.
  - The craftsperson activates the Hunt Make Busy feature using configuration.
  - The agent transitions out of Busy state and its Hunt make Busy status = ON.
- See Part II, Appendix A, “CSTA Call Scenarios”, for more information.

4.11.2.3 Agent Ready

The Agent Ready event indicates that an agent has entered the Ready state.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
agentDevice	Y	The device ID specifies the directory number of the agent device that is Ready.
agentID	N	Indicates the agent identifier.
acdGroup	N	Indicates the ACD group. Agent is Ready for all groups where it is a member.
cause	Y	Indicates a reason for the event. Always Normal.

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- Agent Ready event depends on proper provisioning of MHLG for Hunt Make Busy capability. Refer to Chapter 3, “Administration and Management Considerations for CSTA” for details.
- Typical examples of when this event may be generated are:
  - An agent auto-work timer expires. (This is a configuration option also known as post-call timer.)
  - An agent invokes the Hunt Make Busy OFF on the telephone.
  - The agent invoked Agent Ready by using the Set Agent State service.
  - The agent transitions out of Busy state and its Hunt make Busy is OFF
  - The craftsperson deactivates the Hunt Make Busy feature using configuration.
- See Part II, Appendix A, “CSTA Call Scenarios”, for more information.

4.11.2.4 Agent Working After Call

The Agent Working After Call event indicates that an agent has entered the Working After Call state. In this state an agent is no longer connected to a call distributed from the group device but is still occupied with work related to a previously distributed call. In this state, an agent cannot receive another call distributed from an associated group device. The agent may be performing administrative duties (for example, updating a business order form) for a previous call.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
agentDevice	Y	The device ID specifies the directory number of the agent device.
acdGroup	Y	This parameter is provided when the event is associated with a group device where the Post Call Timer expired.
pendingAgentState	Y	Indicates the agent state that the agent transitions to after the agent state is no longer WorkingAfterCall. Supported states: • Not Ready • Ready • Null
agentID	N	Indicates the agent identifier.
cause	Y	Indicates a reason for the event. Always AutoWork.

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- Agent Working After Call event depends on proper provisioning of MHLG for Post Call Timer capability. Refer to Chapter 3, “Administration and Management Considerations for CSTA” for details.
- This event occurs when an agent completes a call distributed from an MLHG provisioned with Post Call Timer capability. Post Call Timer is not supported for MLHG in Manual (Application controlled distribution).
- See Part II, Appendix A, “CSTA Call Scenarios”, for more information.

4.11.2.5 Call Back Event

The Call Back event indicates that a call back feature has been set or cancelled between two devices.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
originatingDevice	Y	Indicates the DeviceID of the originating device when the call back relationship was established.
targetDevice	Y	Indicates the DeviceID of the target device when the call back relationship was established. This parameter is empty if all callbacks are canceled.
callBackSetCancelled	Y	Indicates whether a call back was set or cancelled. Supported values: • FALSE - Call Back was cancelled. • TRUE - Call Back was set.

OpenScape Voice Operational Notes

- The originatingDevice and targetDevice must be provisioned for callback service.
- Multiple Call Back Events are NOT sent after Cancel Call Back - All service requests. Application must assume that the call back list has been cleared after receiving the Cancel Call Back response.
- The targetDevice must be a registered subscriber on the OpenScape Voice or addressable, for example, via a SIP-Q gateway.

4.11.2.6 Do Not Disturb

The Do Not Disturb event indicates that the do not disturb feature has been changed for a device.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
device	Y	Indicates the device where the do not disturb feature was changed.
doNotDisturbOn	Y	Specifies the current state of DND. Supported values: • TRUE = Do Not Disturb is active • FALSE = Do Not Disturb is inactive

OpenScape Voice Operational Notes

- If the device is an internal MLHG (Hunt Group) the event provide status of the Night Service overflow for the group.
- To synchronize OpenScape Voice centralized Call Forwarding with an OpenStage the CSTA device category must be set to “CSTA over SIP”. If multiple device contacts are registered with uaCSTA then the DND event is sent to all contacts.

4.11.2.7 Forwarding

The Forwarding event indicates that the forwarding feature has been changed for a device.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
device	Y	Indicates the device where the forwarding feature was changed.
forwardingType	Y	Indicates the type of forwarding. Supported values: • forwarding Immediate • fowardBusy • fowardNoAns
forwardStatus	Y	Indicates the status of the forwarding type. Supported Values: • FALSE - the forwarding type is deactivated • TRUE - the forwarding type is active
forwardTo	Y	Specifies the destination to which calls are forwarded. It is only provided when call forwarding is being activated.
ringCount	N	Specifies the number of times a device should ring prior to forwarding no answer.
ringDuration	N	Specifies the time (in seconds) that the device should ring prior to forwarding no answer. ringDuration should not be provided if ringCount is provided.

OpenScape Voice Operational Notes

- CSTA exposes OpenScape Voice Call Forwarding status for Immediate, No Answer and Busy variants only.
- To synchronize OpenScape Voice centralized Call Forwarding with an OpenStage the CSTA device category must be set to “CSTA over SIP”. If multiple device contacts are registered with uaCSTA then the forwarding event is sent to all contacts.

4.12 Device Maintenance

4.12.1 Events

OpenScape Voice does not support the Partially in Service event.

The following table illustrates actions that may cause the transmission of a CSTA Back in Service or Out of Service event:

Action	Device State	Event transmitted
An application starts monitor on device (DN)	Registered	None *
	Deregistered	None *
Monitored device (DN) is blocked	Blocked	Out of Service ***
Monitored device (DN) is deleted using administration.	Deleted	None (no existing monitor)
Monitored device (DN) is unblocked	Unblocked	None (no existing monitor)
Monitored device (DN) registers with OpenScape Voice	Registered	Back in Service **
Monitored device (DN) deregisters with OpenScape Voice	Deregistered	Out of Service **
Monitored device (DN) is suspended	Registered	Out of Service **
An application or OpenScape Voice stops monitor on device (DN)	Last known state	None

* The application may send a Snapshot device to determine device maintenance state. OpenScape Voice returns an error code in the Snapshot device response if the device is provisioned and not in service, unless device is provisioned only (for example, virtual device).

** OpenScape Voice uses device state transition hysteresis to avoid performance problems by generating too many unnecessary events.

*** Subscriber is no longer valid for CSTA Services.

4.12.1.1 Back in Service

The Back in Service event indicates that the device has been returned to service and is operating normally.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
Device	Y	Indicates the device that is back in service.
Cause	Y	Specifies a reason for the event. Always Normal.

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- This event is sent when the SIP device registers. In the case of multiple devices registrations for the same DN, this event is sent when the first contact for the DN registers.
- Not provided for Group Device (MLHG Pilot).
- The Back in Service event does not imply that the capabilities of the device out of service have changed.

4.12.1.2 Device Capabilities Changed

The Device Capabilities Changed event indicates that device level information that can be obtained with the capability exchange services (for example, Get Logical Device Information services) has changed.

The current device level capability information can be obtained by issuing a Get Physical Device Information and/or a Get Logical Device Information service.

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
device	Y	Indicates the device whose information has changed. See usage notes below.
cause	Y	Specifies a reason for the event

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- The device capabilities event is sent by OpenScape Voice in the following case(s):
  - When a member is added to a Group Device (MLHG) Pilot DN using administration.
  - When a member is removed from a Group Device (MLHG) Pilot DN using administration.
- The subjectDeviceID is the Group Device Pilot DN.
- The Device Capabilities Changed event shall be generated for the above condition whether or not the device level capability information has been previously obtained using the capability exchange services.

4.12.1.3 Out of Service

The Out Of Service event indicates that the device has entered a maintenance state (that is, has been taken out of service) and can no longer accept calls and some categories of CSTA service requests (Call Control services, for example).

Event Parameters

Parameter Name	Supported	Comments
monitorCrossRefID	Y	Associates the event to an established monitor.
Device	Y	Indicates the device that has been taken out of service.
Cause	Y	Specifies a reason for the event, always event cause'Normal'

Event Causes

Cause code = Normal.

OpenScape Voice Operational Notes

- Event is reported when SIP device de-registers. In the case of multiple devices, registrations for the same DN event are sent only when the last contact for the DN un-registers.
- Event reported when a SIP device behind a proxy enters the "suspended" state. The Suspended state is detected when the associated proxy is not reachable (e.g. WAN connection is down, Proxy failure, Call Admission Control restriction, etc.).
- When a device goes out of service, existing monitors are not removed, existing MonitorCrossRefIds remains valid.
- Snapshot services results in a negative acknowledgement (error code: Device Out of Service) if attempted on a device out of service.

4.13 I/O Services

Service Not Supported

I/O-Services support the exchange of data between a computer application (a computing function component) and a telephony device (to send Data from the computer application to the display of a telephony device, or to send Data from the keypad of a telephony device to the computer application, etc.).

4.14 Vendor Specific Extensions Service

Service Not Supported

CSTA allows the provision of value added services and events that are beyond what is defined in this Standard. It is possible both to extend the existing services and events defined in this Standard as well as to create completely new services and events. A vendor may choose to support a vendor specific extension with the understanding that it may not interoperate with other CSTA (Phase III)-compliant products.

4.15 Data Collection Services

Service Not Supported

The Data Collection services are used to collect information such as DTMF/rotary pulse digits and Telephony Tones that is received by a device over a connection.

4.16 Voice Services and Events

Service Not Supported

A Voice Unit device allows messages consisting of voice stream data to be created, manipulated, played to a Connection, or recorded from a Connection. A Voice Unit device can be observed and controlled using the CSTA Voice services.

A CSTA Call Scenarios

PART II - CSTA Call Scenarios are mostly written in the format of ECMA TR/82 (ECMA TR/82 Scenarios for Computer Supported Telecommucation Applications (CSTA) Phase III), and describe specific call flows between a CSTA-enabled application and OpenScape Voice.

The Call scenarios are Excel files that make up this part of the document. They are located in a zip file in eDoku under *OpenScape Voice V5 Interface Manual: Volume 4, CSTA Interface*.

B Private Number Plan Considerations

OpenScape Voice subscribers can be categorized in 5 basic types of subscribers:

- **Type I**: **Subscriber with public network number only**. This is the type of subscriber that is most used currently. This subscriber belong to a company that does not provide a private numbering plan.
- **Type II**: **Subscriber with private network number only**. This subscriber belong to a company that does provide a private numbering plan. This company probably does not have very many public network numbers and therefore, must create some users that do not have a public network number. The public network number presented for these users may be the BG Main Number or the number provisioned in the Outgoing Presentation Call Status feature – if assigned to the subscriber. (*)
- **Type III**: **Subscriber with private network number derived from public network number**. This subscriber has a public network number and a private network number linked using the extension part of the public number. For this subscriber, the office code of their Home DN uses the office code of the public network number.
- **Type IV**: **Subscriber with private network number not derived from public network number**. This subscriber has a public network number and a private network number where the extension part of the public network number and the extension part of the private network number are not the same. For this subscriber, the office code of their Home DN uses the office code of the public network number. The private network number cannot be displayed by OpenScape Voice. Only translation is capable of resolving the private network number to the subscriber who owns the private network number.
- **Type V**: **Subscriber that only has an extension**. These subscribers have neither a private network number nor a public network number. For this subscriber an office code with the leading three digits of the extension must be created. Another approach could be to force the definition of a private location code and force this type of subscriber into the Type II number scheme. OpenScape Voice currently cannot configure this kind of subscriber.

(*) There are customers (for example IBM) that actually configure their switch with only Type II numbers and provide a separate public network number for each subscriber via the Outgoing Call Presentation Status feature.

Note: This Appendix provides information about the configuration of Type II numbers and explains how to properly configure these Type II numbers.

B.1 Configuring BGLs with Private Network Numbers Only

From an administrator's perspective, the administrator creates either a *private* or a *public* office code, then creates ranges of *private* or *public* Home DNs and finally assigns a free *private* or *public* home DN when creating a subscriber.

When introducing private numbering plans, the *External DN* flag must be unchecked when creating a subscriber with a Home DN that is considered 'private'.

This has as consequence that the office code and the Home Directory Numbers, created from the office codes, are actually private or public network agnostic and they should also be treated as such. Whether a Home DN is private or public actually only gets determined when the subscriber is created.

This understanding is very important for what follows – it explains why some actions which don't seem logical are actually necessary.

B.1.1 Office Code

When creating a *public* office code, the Country Code, Area Code and Local Office Code are filled in as determined by the public numbering plan authority.

There are 3 possible types of *private* office codes:

- **Level 2 Office Code** — Subscribers belong to 3 hierarchical levels: L0, L1 and L2. Each level is represented by a code.
- **Level 1 Office Code** —Subscribers belong to 2 hierarchical levels: L0 and L1. Each level is represented by a code.
- **Level 0 Office Code** —Subscribers have a single hierarchical level represented by their L0 code.

When creating a *private* office code, the digits of the L2 Code, L1 Code and L0 Code must be distributed amongst the Country Code, Area Code and Local Office Code fields of the office code. When OpenScape UC is involved, then it is important that all fields of the office code receive a value. The reason for this is that only office codes with country code, area code and local office code fields are synchronized from OpenScape Voice to OpenScape UC and OpenScape UC does not allow the creation of office codes (it only allows the conversion of an office code to a private office code). Therefore, a private office code must be created according to the following table:

Private Office Code		**Office Code**		
		Country Code	**Area Code**	**Local Office Code**
Level 2		L2 Code	L1 Code	L0 Code
Level 1	L1 Code Length > 1 digit	First digit of L1 Code	Remainder of L1 Code	L0 Code
	L1 Code Length = 1 digit & L0 Code Length > 1 digit	L1 Code	First digit of L0 Code	Remainder of L0 Code
	L1 Code Length = 1 digit & L0 Code Length = 1 digit	**Not supported**		
Level 0	L0 Code Length >= 3 digits	First digit of L0 Code	Second digit of L0 Code	Remainder of L0 Code
	L0 Code Length < 3 digits	**Not supported**		

Examples:

Private Office Code		**Office Code**		
		Country Code	**Area Code**	**Local Office Code**
Level 2	58-57-56	58	57	56
Level 1	-57-56	5	7	56
	-5-756	5	7	56
	-5-7	**Not supported (at least 3 digits are required for the private office code)**		
Level 0	--567	**5**	6	7
	--56	**Not supported (at least 3 digits are required for the private office code)**		

As can be seen, the minimum private office code contains at least 3 digits and the digits are distributed among the available Office Code fields (Country Code, Area Code and Local Office Code).

B.1.2 Home Directory Numbers

Home Directory Numbers are created from the office code as before.

B.1.3 Subscribers

Subscribers must be created using the office codes and free Home Directory Numbers within the office code. For each subscriber to which a private Home DN is assigned the *External DN* must be unchecked at time of creation. Note that this flag cannot be modified once the subscriber is created.

B.1.4 Dial Plans and Routing

Administrators can use multiple ways in the numbering plan to route to one of these private subscribers.

- Direct Routing from the Destination Codes table
- Indirect Routing
  - Routing via Extensions table
  - Routing via Location Codes table

In the examples used in the following sections, a Level 1 Type II subscriber is created as follows:

Office code: 5758 (country code 5, area code 7, local office code 58)

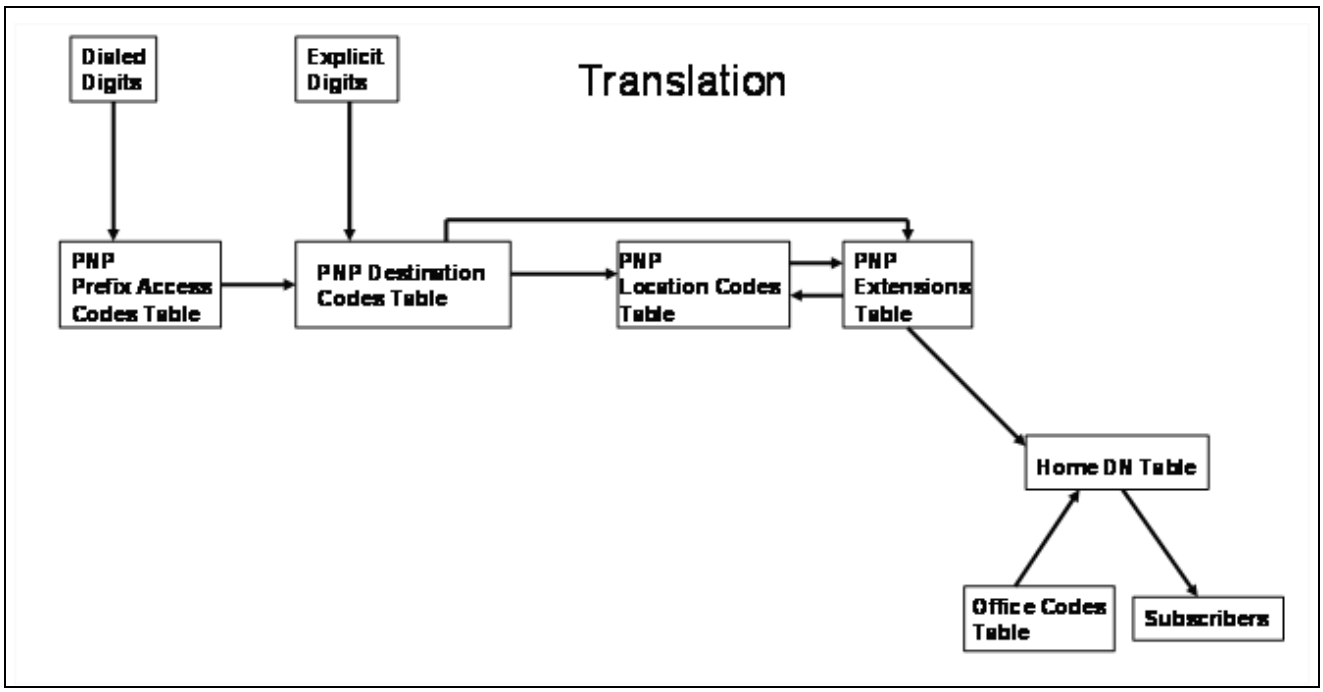
Home DNs: 57581001, 57581002

Subscribers: 57581001, 57581002

The L1Code is 57 and the L0 code is 58.

B.1.4.1 Direct Routing from Destinations Codes Table to Home DN

An administrator that wants to route calls for Type II subscribers directly to the Home DN table from the Destination Codes table must enter the destination codes table with the full Home DN and with the appropriate NOA (L2, L1 or L0).



For private numbers, the full Home DN – also known as the fully qualified private number – is required because OpenScape Voice cannot complete a lower level number to the highest level number because the office code that would be used to do these conversions does not necessarily contain the correct private level information. For the same reason, the appropriate NOA must be delivered to the Destination Codes table as well.

As an example of direct routing using the destinations codes table – if in a level 1 private numbering plan 2 subscribers of the same L1 code dial an L0 prefix access code and the L0 number of each other, the prefix access codes table should contain an entry for the L0 prefix code that completes the dialed number to the fully qualified L1 number by inserting the L1 code in the L0 PAC and setting the NOA to L1. The destination codes table can then be set up to point to the office code of the destination. The translation engine will then be able to output the correct private number level for the office code.

For example, suppose a Level 1 Type II subscriber (57581002) with office code 5-7-58. Suppose that level1 numbers do not need a prefix access code then, the entry in the PAC table to do extension dialing between the 2 subscribers would be something along the line of:

> PAC: 1; Min Length: 4; Max Length: 4; Digit Pos: 0; Insert: 5758; Prefix Type: On-net Access; Nature of Address: PNP Level 1; Destination Type: None; Destination Name: empty.

When 1002 is dialed, this PAC table rule will apply and because the Destination Type is none, the 57581002 number will be routed to the PNP Destination Codes table and try to find a rule there that matches the leading digits of the number and the nature of address: PNP Level 1. So, we must provide an entry in the PNP's destination codes table along the following line:

Dest Code: 5; Nature of Address: PNP Level 1; Destination Type: Home DN; DN Office Code: 5758.

The translation engine deliver as output the subscriber object that belongs to 57581002, the number and the nature of address that were presented to the Destination Codes table: 57581002/PNP Level 1.

B.1.4.2 Indirect Routing

If an administrator does not want to complete the number at the PAC level or if the explicit digits coming in from e.g. a SIP-Q gateway do not form a fully qualified private number for a Type II subscriber, then the only option is to go through the home extensions tables either using the home location table or directly from the destination codes table. Note that for this type of configuration, the use of the common numbering plan to resolve the translation is not allowed. In other words, it is not allowed to handle extensions in the common numbering plan, they must be handled in the private numbering plan of the subscriber requesting the translation.

Routing using Extensions Table

If the destination codes table contains an entry with NOA PNP Extension, then the administrator may route further translation to the Home Extensions table. Translation then tries to find a matching entry in the private numbering plan's extension table. If this is the extension of a subscriber with a private Home DN number then the extensions table is required to complete the number to the Home DN of the extension. To recognize that this is a private Home DN, a location code must be created with the exact same digits as the office code used to create the Home DN. This location code then breaks down the office code correctly into the private level codes. If the location code is not entered then the translation engine assumes that the office code is a public office code and returns an International NOA for the translation result.

As an example of indirect routing using the extensions table – if in a level 1 private numbering plan 2 subscribers of the same L0 code dial the extensions of each other, the prefix access codes table should contain an entry for the most significant digit of the extension, not modify the number and set the NOA to PNP Extension. The destination codes table can then be set up to point to the Home Extension table. A location code is then created with the exact same digits as the office code used to create the Home DN of the extension. The location code contains the correct breakdown of the private number allowing the translation

engine to determine the level of the fully qualified private number. An entry is then created in the extensions table that points to the office code and the just created location code.

In the example, the Prefix Access Codes table would look as follows:

> PAC: 1; Min Length: 4; Max Length: 4; Digit Pos: 0; Insert: none; Prefix Type: On-net Access; Nature of Address: PNP Extension; Destination Type: None; Destination Name: empty.

When 1002 is dialed, this PAC table rule applies and because the Destination Type is **None**, the 1002 number is routed to the PNP Destination Codes table and tries to find a rule there that matches the leading digits of the number and the nature of address: PNP Extension. So, an entry in the PNP's destination codes table must be provided along the following line:

> Dest Code: 1; Nature of Address: PNP Extension; Destination Type: Home Extension.

Translation looks for an entry must be provided:

> Prefix: 1, Length: 4, Location code: 5758, E164 Prefix: 57581, Destination Type: Home DN, Office Code: 5758.

Note that the Location Code 5758 should have been created already:

> Code: 5758, L0 Length: 2, L1 Length: 2, L2 Length: 0, Number of digits to skip: 4

Because the location code and the office code are an exact match in the extension table, the translation engine delivers as output the subscriber object that belongs to 57581002, the completed number 57581002 and as nature of address the highest level read from the Location Codes table entry 5758 which is PNP Level 1 as the length of the L2 level is 0.

Routing using Location Codes tables

If the destination codes table contains an entry with NOA PNP Level 1 or PNP Level 0, then the administrator may route further translation to the Home Location table. The Location table is then used to strip the private number further down until only the extension remains. The extension is then passed to the Home Extension table and the same processing as for Routing using Extensions Table is done.

As an example of indirect routing via the location codes table – if in a level 1 private numbering plan 2 subscribers of the same L1 code dial an L0 prefix access code and the L0 number of each other, the prefix access codes table should contain an entry for the L0 prefix code, modify the number to remove the prefix and set the NOA to PNP Level 0. The destination codes table can then be set up to point to the Home Location table. A location code is then created with the exact same digits as the office code used to create the Home DN of the

extension. An entry is then created in the extensions table that points to the office code and the just created location code, which will be used to determine the level of the fully qualified private number.

In the example, the Prefix Access Codes table would look as follows, assuming the prefix access code for L0 dialing is 7:

> PAC: 7; Min Length: 7; Max Length: 7; Digit Pos: 1; Insert: none; Prefix Type: On-net Access; Nature of Address: PNP Level 0; Destination Type: None; Destination Name: empty.

When 7581002 is dialed, this PAC table rule applies and because the Destination Type is none, the 581002 number (the first digit is deleted) will be routed to the PNP Destination Codes table and try to find a rule there that matches the leading digits of the number and the nature of address: PNP Level 0. You must provide an entry in the PNP's destination codes table along the following line:

> Dest Code: 5; Nature of Address: PNP Level 0; Destination Type: Home Location.

Translation now looks for an entry with matching leading L0 level digits in the PNP's Location codes table, so we must provide this entry:

> Code: 5758, L0 Length: 2, L1 Length: 2, L2 Length: 0, Number of digits to skip: 4

Translation matches this as the L0 for this entry starts with 58. Translation skips the remaining 2 digits and present 1002 to the PNPs Extension table so we must provide this entry:

> Prefix: 1, Length: 4, Location code: 5758, E164 Prefix: 57581, Destination Type: Home DN, Office Code: 5758.

Because the location code and the office codes are an exact match in the extension table, the translation engine deliver as output the subscriber object that belongs to 57581002, the completed number 57581002 and as nature of address the highest level read from the Location Codes table entry 5758 which is PNP Level 1 as the length of the L2 level is 0.

B.1.5 Number Modification

It may be necessary to enter information in the number modification tables to be able to understand and correctly break down numbers received from endpoints. Also for subscribers, the number definition tables need to be set up correctly in order for OpenScape Voice to understand how to break down a private number into its components. For OpenScape UC, Number Definition entries will be needed to add associated devices that are not known to OpenScape UC.

B.1.6 Restrictions

There are a few restrictions with this approach:

- Office codes of private Home DNs must have a minimum of 3 digits. This is because it must be possible to distribute these digits over the country code, area code and local office code.
- Office codes of private Home DNs are unique system-wide resources, because office codes themselves are unique resources. This means that 2 BG's cannot share the same private office codes or Home DNs.

When OpenScape UC is involved there are more restrictions:

- All subscribers with private numbers must have the same private number level (such as all of level 1 or all of level 2). If different levels are necessary then multiple OpenScape UC systems must be deployed.
- All private office codes must be made translatable in each PNP of OpenScape Voice (without the use of a barrier code and/or prefixes). Barrier codes and Level 2 or Level 1 prefixes are not allowed to be configured in the OpenScape UC configuration (Resources tab). OpenScape UC always gets the fully qualified private number from the OpenScape Voice CSTA service and may use this number on make call requests to OpenScape Voice. Therefore, OpenScape Voice must be ready to receive these numbers.

For example, if the dialing pattern for the OpenScape UC subscriber 57581002 is that no barrier code is required for on-net dialing and that a prefix 7 is required for dialing L0 numbers and that to dial L1 numbers a prefix 8 is required, then the OpenScape Client with number 57581002 is used to dial the extension of 57581001: 1001. To dial a number of a subscriber that is in the same L1 code (57), the OpenScape Client would be used to dial 7, followed by the L0 number of the destination subscriber. To dial a number of a subscriber that is in another L1 region, the OpenScape client would be used to dial 8, followed by the L1 number (fully qualified private number) of the destination subscriber. The office code 5-7-58 is synchronized to OpenScape UC and is converted to a Private Office Code:

> PN Code ID: 5758, Barrier Code (must be empty), Level 2 Code: empty, Level 1 Code: 57, Level 0 Code: 58, Overlap: 0, Level 2 Prefix (must be empty), Level 1 Prefix (must be empty).

When the OpenScape client 1002 tries to add the extension 1001 as an associated device, OpenScape UC will pass 57581002 and 1001 to OpenScape Voice which will look up the numbering plan used by 57581002, translate 1001 using this numbering plan, find that this is a Home DN (57581001, PNP Level 1) and it will deliver the fully qualified private number 57581001 back to OpenScape UC which will store this number for correlation and further usage. Whenever the OpenScape Client uses 1001 as an associated device, OpenScape UC creates a dialable number for 57581001 by adding the barrier code and the prefixes. As

it is not allowed to enter values here, OpenScape UC will request OpenScape Voice to use 57581001 for this call. Therefore, OpenScape Voice needs to be able to translate the fully qualified private number 57581001.

- The barrier code and the L2/L1 prefix codes fields in the Private Office Code configuration for OpenScape UC must remain empty. This does not mean that the OpenScape Desktop Client is not allowed to use the barrier codes and prefixes when dialing or assigning preferred devices. The reason for not allowing barrier codes and level2 or level 1 prefixes to be entered is that there are situations where OpenScape UC adds the wrong barrier codes and prefixes to a number. Currently, OpenScape may not always retrieve the barrier code from the correct location and therefore it is nearly impossible for an administrator to know which entries are required in the PNPs of the OpenScape UC subscribers. The exact problem occurs when a Type III subscriber adds a Type II subscriber as an associated device. For the Type II subscriber, OpenScape Voice returns a fully qualified private number to OpenScape UC. OpenScape UC tries to make a dialable number when the OpenScape Client tries to make a call using this Type II subscriber as an associated device; however it only has the public office code settings of the Type III subscriber and does not know how to make the private number dialable. To do this, OpenScape UC currently looks for the first available private office code and uses its settings. These settings are not always guaranteed to be the right settings; hence the requirement to keep the barrier code and level 2 or level 1 prefix fields empty and make the fully qualified private numbers dialable in all relevant PNPs (probably it's best to push the handling of these fully qualified numbers to the common numbering plan) and use Direct Routing from Destinations Codes Table to Home DN.

C Supported CSTA Services and Events by Device Type

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
CAPABILITIES EXCHANGE SERVICES								
Services								
get CSTA features (C → S)	Yes		Yes	Yes	Yes	Yes		
get logical device Information (C → S)	Yes		Yes	Yes	Yes	Yes		
get physical device information (C → S)	Yes		Yes	Yes	No	Yes		
get switching function capabilities (C → S)	Yes		Yes	Yes	Yes	Yes		
get switching function devices (C → S)	Yes		No	No	Yes	No		
switching function devices (S → C)	Yes		No	No	Yes	No		
SYSTEM SERVICES								
Registration Services								
change system status filter (C → S)	No							
system register (C → S)	Yes		-[1]	-	-	-		
system status register abort (S → C)	No							
system status register cancel (C → S)	No							
Services								
request system status (C ←→S)	Yes		-	-	-	-		
system status (C ←→S)	Yes		-	-	-	-		
switching function capabilities changed (S → C)	No							
switching function devices changed (S → C)	No							
MONITORING SERVICES								
change monitor filter (C → S)	Yes		Yes	Yes	Yes	Yes		
monitor start (C → S) (device monitor only)	Yes		Yes	Yes	Yes	Yes		
monitor stop (C ←→ S) (device monitor only)	Yes		Yes	Yes	Yes	Yes		
SNAPSHOT SERVICES								
Services								
snapshot call (C → S)	Yes	Yes	Yes	Yes	Yes	Yes		
snapshot device (C → S)	Yes	Yes	Yes	Yes	Yes	Yes		
snapshot calldata (S → C)	No							
snapshot device data (S → C)	Yes	Yes	Yes	Yes	Yes	Yes		

Table 9 Supported CSTA Services and Events (Sheet 1 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
APPLICATION SESSION SERVICES								
Services								
start application session (C → S)	Yes		-	-	-	-		
stop application session (C → S)	Yes		-	-	-	-		
reset application session timer (C → S)	Yes		-	-	-	-		
application session terminated (S → C)	Yes		-	-	-	-		
CALL CONTROL								
Services (C → S)								
accept call	Yes	Yes	Yes	Yes	No	Yes		
alternate call	Yes	Yes	No*	Yes	No	Yes		* SIP 3PCC limitation
answer call	Yes	Yes	No	Yes	No	Yes		
call back call-related	No							
call back message call-related	No							
camp on call	No							
clear call	No							
clear connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
conference call	Yes*	**	Yes	Yes	No	Yes		* Station controlled via LCS only ** ONS = OND only
consultation call	Yes	Yes	Yes	Yes	No	Yes	Yes	
deflect call (target is the alerting party)	Yes	Yes	Yes	Yes	Yes	Yes		
deflect call (target is the calling party)	No							
dial digits	No							
directed pickup call	No							
group pickup call	No							
hold call	Yes	Yes	Yes	Yes	No	Yes	Yes	Key system (multi-line device) only
intrude call	No							
join call	Yes	Yes	Yes	Yes	No	Yes		
make call (do not prompt / handsfree)	Yes	Yes	No	Yes	No	Yes	Yes	
make call (prompt / manual)	Yes	Yes	Yes	Yes	No	Yes	Yes	

Table 9 Supported CSTA Services and Events (Sheet 2 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
make predictive call	No							
park call	No							
reconnect call	Yes	Yes	No	Yes	No	Yes		
retrieve call (from hold)	Yes	Yes	Yes*	Yes	No	Yes	Yes	* Not possible if manually placed on hold by device ** Key system (multi-line device) only
send message	No							
single step conference call	No							
single step transfer	Yes	Yes	Yes	Yes	No	Yes		
transfer call	Yes	Yes	Yes	Yes	No	Yes		
Events								
bridged	No							
call cleared	No							
conferenced	Yes*	Yes	Yes	Yes	No	Yes		* Station controlled via LCS only
connection cleared	Yes	Yes	Yes	Yes	Yes	Yes		
delivered	Yes	Yes	Yes	Yes	Yes	Yes		
digits dialed	No							
diverted	Yes	Yes	Yes	Yes	Yes	Yes		
established	Yes	Yes	Yes	Yes	No	Yes		
failed	Yes	Yes	Yes	Yes	Yes	Yes		
held	Yes	Yes	Yes	Yes	No	Yes		
network capabilities changed	No							
network reached	Yes	Yes	Yes	Yes	No	Yes		
offered	Yes	Yes	Yes	Yes	No	Yes		
originated	Yes	Yes	Yes	Yes	No	Yes		
queued	Yes	Yes	No	No	Yes	No		
retrieved	Yes	Yes	Yes	Yes	No	Yes		
service initiated	Yes	Yes	Yes	Yes	No	Yes		
transferred	Yes	Yes	Yes	Yes	No	Yes		

Table 9 Supported CSTA Services and Events (Sheet 3 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
CALL ASSOCIATED FEATURES								
Services (C → S)								
associate data	No							
cancel telephony tones	No							
change connection information	Yes	Yes	Yes	Yes	No	Yes		
generate digits	Yes	Yes	Yes	Yes	No	Yes	Yes	Generated by phone via usCSTA
generate telephony tones	No							
send user information	No							
Events								
call information	Yes	Yes	Yes	Yes	Yes	Yes		
charging	No							
digits generated	Yes	Yes	Yes	Yes	No	Yes	Yes	
telephony tones generated	No							
service completion failure	No							
MEDIA ATTACHEMENT SERVICES & EVENTS								
Services (C → S)								
attach media service	No							
detach media service	No							
Events								
media attached	No							
media detached	No							
ROUTING SERVICES								
Registration Services								
route register (C → S)	No							
route register abort (S → C)	No							
route register cancel (C → S)	No							
Services								
reroute (S → C)	No							
route end (C → S)	No							

Table 9 Supported CSTA Services and Events (Sheet 4 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
route reject (C → S)	No							
route request (S → C)	No							
route select (C → S)	No							
route used (S → C)	No							
PHYSICAL DEVICE FEATURES								
Services (C → S)								
button press	No							
get auditory apparatus information	No							
Get button information	No							
Get display	No							
Get hook switch status	No							
Get lamp information	No							
Get lamp mode	No							
Get message waiting indicator	Yes		Yes	Yes	No	Yes		
Get microphone gain	No							
Get microphone mute	Yes		No	No	No	Yes	Yes	
Get ring status	No							
Get speaker mute	No							
Get speaker volume	Yes		No	No	No	Yes	Yes	
Set button information	No							
Set display	No							
Set hook switch status	No							
Set lamp mode	No							
Set message waiting indicator	No							
Set microphone gain	No							
Set microphone mute	Yes		No	No	No	Yes	Yes	
Set ringer status	No							
Set speaker mute	No							
Set speaker volume	Yes		No	No	No	Yes	Yes	
Events								
button information	No							
button pressed	No							

Table 9 Supported CSTA Services and Events (Sheet 5 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
display updated	No							
hook switch	No							
lamp mode	No							
message waiting status	Yes		Yes	Yes	No	Yes		
microphone gain	No							
microphone mute	No							
ringer status	No							
speaker mute	No							
speaker volume	No							
LOGICAL DEVICE FEATURES								
Services (C → S)								
call back non-call-related	Yes		Yes	Yes	No	Yes		
call back message non-call-related	No							
cancel call back	Yes		Yes	Yes	No	Yes		
cancel call back message	No							
get agent state	Yes		Yes	Yes	No	Yes		
get auto work mode	No							
get caller ID status	No							
get do not disturb	Yes		Yes	Yes	Yes	Yes	Yes	
get forwarding	Yes		Yes	Yes	No	Yes	Yes	
Get last number dialed	No							
Get routing mode	No							
Set agent state	Yes		Yes	Yes	No	Yes		
Set auto answer mode	No							
Set auto work mode	No							
Set caller ID status	No							
Set do not disturb	Yes*		Yes	Yes	Yes**	Yes	Yes	* OSV DND feature only ** Night Mode control
Set forwarding	Yes*		Yes	Yes	No	Yes	Yes	* OSV Call Forwarding features only
Set routing mode	No							
Events								
agent busy	Yes		Yes	Yes	No	Yes		

Table 9 Supported CSTA Services and Events (Sheet 6 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
agent logged off	No							
agent logged on	No							
agent not ready	Yes		Yes	Yes	No	Yes		
agent ready	Yes		Yes	Yes	No	Yes		
agent working after call	Yes		Yes	Yes	No	Yes		
auto answer	No							
auto work mode	No							
callback event	Yes		Yes	Yes	No	Yes		
callback message	No							
caller ID status	No							
do not disturb	Yes*		Yes	Yes	Yes**	Yes	Yes	* OSV DND feature only ** Night Mode status
forwarding	Yes*		Yes	Yes	No	Yes	Yes	* OSV Call Forwarding features only
routing mode	No							
DEVICE MAINTENANCE EVENTS								
Events								
back in service	Yes		Yes	Yes	Yes	Yes		
out of service	Yes		Yes	Yes	Yes	Yes		
device capability changed	Yes		No	No	Yes	No		
device partially in service	No							
I/O SERVICES								
Registration Services								
I/O register (C → S)	No							
I/O register abort (S → C)	No							
I/O register cancel (C → S)	No							
I/O Services								
data path resumed (S → C)	No							
data path suspended (S → C)	No							
fast data (C ←S)	No							
fast data (C → S)	No							
resume data path (C → S)	No							
send broadcast data (C → S)	No							

Table 9 Supported CSTA Services and Events (Sheet 7 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
send data (S → C)	No							
send data (S ← C)	No							
send multicast data (C → S)	No							
start data path (S ← C)	No							
start data path (S ← C)	No							
stop data path (S → C)	No							
stop data path (S ← C)	No							
suspend data path (S → C)	No							
suspend data path (S ← C)	No							
DATA COLLECTION SERVICES								
Services								
Data Collected (S → C)	No							
Data Collection Resumed (S → C)	No							
Data Collection Suspended (S → C)	No							
Start Data Collection (C → S)	No							
Stop Data Collection (C ←→ S)	No							
Suspend Data Collection (C ←→ S)	No							
VOICE SERVICES & EVENTS								
Services (C → S)								
	No							
clear	No							
concatenate message	No							
deactivate	No							
delete message	No							
play message	No							
query voice attribute	No							
queue	No							
record message	No							
reposition	No							
resume	No							
review	No							
set voice attributes	No							

Table 9 Supported CSTA Services and Events (Sheet 8 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
start	No							
stop	No							
suspend	No							
synthesize message (text to speech)	No							
Events								
bookmark reached	No							
completed	No							
DTMF detected	No							
emptied	No							
interrupted detection	No							
not recognized	No							
play	No							
recognized	No							
record	No							
review	No							
silence timeout expired	No							
started	No							
stop	No							
suspend play	No							
suspend record	**No**							
voice attribute changed	**No**							
voice error occurred	**No**							
CALL DETAIL RECORD (CDR) SERVICES								
Services								
call detail records notification (S → C)	No							
call detail records report (S → C)	No							
send stored call detail records (C → S)	No							
start call detail records transmission (S → C)	No							
stop call detail records transmission (C ←→ S)	No							
VENDOR SPECIFIC EXTENSIONS SERVICES & EVENTS								
Registration Services								

Table 9 Supported CSTA Services and Events (Sheet 9 of 10)

CSTA Services and Events	CSTA Support	ONS Support	Normal	SiemensType1 (e.g., SIP OptiPoint)	Hunt Group (i.e., MLHG Pilot	CSTA Over SIP (OpenStage Only)	uaCSTA Support (OpenStage Only)	Comments
Escape Registration (C → S)	No							
Escape Registration Abort (S → C)	No							
Escape Registration Cancel (C → S)	No							
Services								
Escape (C ←→ S)	No							
Escape Services (Get Lower Class of Service)	No							
Escape Services (Set Lower Class of Service)								
Private Data Version Selection (C → S)	No							
Events								
Private Event	No							

Table 9 Supported CSTA Services and Events (Sheet 10 of 10)

1 A dash (-) means the service is not device specific.

D OpenScape Voice privateData Schema

OpenScape Voice uses ECMA-323 ed4.

D.1 OSV_CSTA_Extensions_Schema_ECMA354

```
<?xml version="1.0" encoding="utf-8" ?>


<!-- OpenScape Voice CSTA Private Data schema definitions-->

<!-- Siemens CSTA-enabled application that compile with ECMA 323
and/or ECMA 354 schema should import the following schema files
from GDMS to include Siemens private data schema.

The ECMA 323 schema used depends on the OpenScape Version.

See examples below.-->


<!-- OpenScape Voice V3.0 - exposes ECMA 323 ed3. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed3.xsd"-->


<!-- OpenScape Voice V3.1 and higer - exposes ECMA 323 ed4. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd"-->


<!-- OpenScape Voice V3.1 and higher - exposes ECMA 354
Application Sessions. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Extensions_Schema_ECMA354.xsd"-->


<xsd:annotation>

 <xsd:documentation>SiemensPD</xsd:documentation>

</xsd:annotation>


<xsd:complexType name="SiemensPD">

 <xsd:sequence>


   <!-- This element is used in the Start Application Session
and Reset Application Session Timer. It is used by the
application to set the Application Heartbeat Timer-->

<xsd:element name="requestedHBT " type="xsd:string"
minOccurs="0" />
```

```
<!-- This element is used in the Start Application Session
Respons and Reset Application Session Timer. It is used to
inform the application of the actual time value for the
Application Heartbeat Timer-->

<xsd:element name="actualHBT " type="xsd:string" minOccurs="0" /
>


 </xsd:sequence>

</xsd:complexType>


</xsd:schema>
```

D.2 OSV_CSTA_Private_Data_Schema_ECMA323_ed4

```
<?xml version="1.0" encoding="utf-8" ?>


<!-- OpenScape Voice CSTA Private Data schema definitions-->

<!-- Siemens CSTA-enabled application that compile with ECMA 323
and/or ECMA 354 schema should import the following schema files
from GDMS to include Siemens private data schema.

The ECMA 323 schema used depends on the OpenScape Version.

See examples below.-->


<!-- OpenScape Voice V3.0 - exposes ECMA 323 ed3. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed3.xsd"-->


<!-- OpenScape Voice V3.1 and higer - exposes ECMA 323 ed4. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd"-->


<!-- OpenScape Voice V3.1 and higher - exposes ECMA 354
Application Sessions. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Extensions_Schema_ECMA354.xsd"-->


<xsd:import namespace="http://www.ecma-international.org/
standards/ecma-323/csta/ed4" schemaLocation="device-
identifiers.xsd"/>
```

```
<xsd:annotation>
 <xsd:documentation>SiemensPD</xsd:documentation>
</xsd:annotation>


<xsd:complexType name="SiemensPD">
 <xsd:sequence>
   <!-- Used by ONS Outbound only service.  This service and
privateData is no longer recommended for use by CSTA enable
applications. See ONS Inbound / Outbound service-->
  <xsd:element name="onsDevice" type="csta:DeviceID"
minOccurs="0" />


<!-- This element is used in Single Step Transfer Service.  Call
is transferred directly to the Voice Mailbox of the
newDestination.-->
   <xsd:element name="transferTarget" type="xsd:string"
minOccurs="0" />


   <!-- This element is used in the Get Logical Device Response
to identify hunt group and SIP subscriber device types.  NOTE:
MLHG subscriber devices are no longer supported -->
   <xsd:element name="devType" minOccurs="0">
     <xsd:simpleType>
       <xsd:restriction base="xsd:string">
         <xsd:enumeration value="MLHGPILOT" />
   <xsd:enumeration value="SIP" />
         <xsd:enumeration value="MGCP" />
       </xsd:restriction>
     </xsd:simpleType>
   </xsd:element>


   <!-- This element is used in the Get Logical Device Response
to identify to provide the BG group name provisioned on the
specified device. -->
   <xsd:element name="busGroupID" type="xsd:string"
minOccurs="0" />


<!-- This element is used in the Get Logical Device Response to
provide the Timezone name provisioned on the specified device. -
->
   <xsd:element name="timeZoneLocation" type="xsd:string"
minOccurs="0" />
```

```
<!-- This element is used in the Monitor Start service for Hunt
Groups pilot DNs only. This element, if sent, enables backup
call distribution mode on the Hunt Group. -->

   <xsd:element name="sessionID" type="xsd:string" minOccurs="0"
/>;


<!-- This element is used in the Make Call and Consultation Call
service request . This information is used to identify the
calling device name to the B-side device.-->

   <xsd:element name="appCallbackID" type="xsd:string"
minOccurs="0" />


   <!-- ;This element is used in the Make Call and Consultation
Call service request . This information is used to identify the
calling device number to the B-side device.-->

<xsd:element name="appCallbackName" type="xsd:string"
minOccurs="0" />


<!-- This element is used in the Deflect Call service request .
If the newDestination is busy the Deflect Call request will be
immediately rejected. Without this privateData normal event
multi-step acknowledgement applies.-->

   <xsd:element name="sid" type="xsd:string" minOccurs="0" />


<!-- This element is used in an ONS Accept Call or Deflect Call
service request . This information is used to prevent ONS re-
Offering-->

   <xsd:element name="noReOffer" type="xsd:string" minOccurs="0"
/>;This element is used in an ONS Accept Call or Deflect Call
service request . This information is used to prevent ONS re-
Offering


 </xsd:sequence>

</xsd:complexType>


</xsd:schema>
```

D.3 OpenScape Voice Import for ECMA 323

OpenScape Voice exposes ECMA-323 ed4. Use the following to import private data schema.

```
<xsd:import namespace=https://www.g-dms.com/livelink/
livelink.exe/35872591/
OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd?func=doc.Fetch&node
id=35872591&viewType=1
```

Copy of import schema text:

```
<?xml version="1.0" encoding="utf-8" ?>

<!-- OpenScape Voice CSTA Private Data schema definitions-->

<!-- Siemens CSTA-enabled application that compile with ECMA 323
and/or ECMA 354 schema should import the following schema files
from GDMS to include Siemens private data schema.

The ECMA 323 schema used depends on the OpenScape Version.

See examples below.-->

<!-- OpenScape Voice V3.0 - exposes ECMA 323 ed3. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed3.xsd"-->

<!-- OpenScape Voice V3.1 and higer - exposes ECMA 323 ed4. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd"-->

<!-- OpenScape Voice V3.1 and higher - exposes ECMA 354
Application Sessions. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Extensions_Schema_ECMA354.xsd"-->

<xsd:import namespace="http://www.ecma-international.org/
standards/ecma-323/csta/ed4" schemaLocation="device-
identifiers.xsd"/>

<xsd:annotation>

 <xsd:documentation>SiemensPD</xsd:documentation>

</xsd:annotation>

<xsd:complexType name="SiemensPD">

 <xsd:sequence>

   <!-- Used by ONS Outbound only service.  This service and
privateData is no longer recommended for use by CSTA enable
applications. See ONS Inbound / Outbound service-->

  <xsd:element name="onsDevice" type="csta:DeviceID"
minOccurs="0" />

<!-- This element is used in Single Step Transfer Service.  Call
is transferred directly to the Voice Mailbox of the
newDestination.-->

   <xsd:element name="transferTarget" type="xsd:string"
minOccurs="0" />

<!-- This element is used in the Get Logical Device Response to
identify hunt group and SIP subscriber device types.  NOTE: MLHG
subscriber devices are no longer supported -->

   <xsd:element name="devType" minOccurs="0">

     <xsd:simpleType>

       <xsd:restriction base="xsd:string">

         <xsd:enumeration value="MLHGPILOT" />
```

```
   <xsd:enumeration value="SIP" />
         <xsd:enumeration value="MGCP" />
       </xsd:restriction>
     </xsd:simpleType>
   </xsd:element>
   <!-- This element is used in the Get Logical Device Response
to identify to provide the BG group name provisioned on the
specified device. -->
   <xsd:element name="busGroupID" type="xsd:string"
minOccurs="0" />
<!-- This element is used in the Get Logical Device Response to
provide the Timezone name provisioned on the specified device. -
->
   <xsd:element name="timeZoneLocation" type="xsd:string"
minOccurs="0" />
<!-- This element is used in the Monitor Start service for Hunt
Groups pilot DNs only. This element, if sent, enables backup
call distribution mode on the Hunt Group. -->
   <xsd:element name="sessionID" type="xsd:string" minOccurs="0"
/>;


<!-- This element is used in the Make Call and Consultation Call
service request . This information is used to identify the
calling device name to the B-side device.-->
   <xsd:element name="appCallbackID" type="xsd:string"
minOccurs="0" />
   <!-- ;This element is used in the Make Call and Consultation
Call service request . This information is used to identify the
calling device number to the B-side device.-->
<xsd:element name="appCallbackName" type="xsd:string"
minOccurs="0" />
<!-- This element is used in the Deflect Call service request .
If the newDestination is busy the Deflect Call request will be
immediately rejected. Without this privateData normal event
multi-step acknowledgement applies.-->
   <xsd:element name="sid" type="xsd:string" minOccurs="0" />
<!-- This element is used in an ONS Accept Call or Deflect Call
service request . This information is used to prevent ONS re-
Offering-->
   <xsd:element name="noReOffer" type="xsd:string" minOccurs="0"
/>;This element is used in an ONS Accept Call or Deflect Call
service request . This information is used to prevent ONS re-
Offering
</xsd:sequence>
</xsd:complexType>
</xsd:schema>
<!-- This element is used in keyset event flow to idendify that
the primeline device is not involved in the call. .-->
```

```
   <xsd:element name="keyOperation" type="xsd:string"
minOccurs="0" />


<!-- This element is used in keyset event flow to idendify 1-way
and 2-way speaker calling-->
   <xsd:element name="intercom" type="xsd:string" minOccurs="0"
/>
```

D.4 OpenScape Voice Import for ECMA 354

OpenScape Voice exposes ECMA 354 Application Sessions. Use the following to import extensions parameter.

```
<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe/35872591/
OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd?func=doc.Fetch&node
id=35872591&viewType=1"-->
```

Copy of import schema text:

```
<?xml version="1.0" encoding="utf-8" ?>

<!-- OpenScape Voice CSTA Private Data schema definitions-->

<!-- Siemens CSTA-enabled application that compile with ECMA 323
and/or ECMA 354 schema should import the following schema files
from GDMS to include Siemens private data schema.

The ECMA 323 schema used depends on the OpenScape Version.

See examples below.-->

<!-- OpenScape Voice V3.0 - exposes ECMA 323 ed3. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed3.xsd"-->

<!-- OpenScape Voice V3.1 and higer - exposes ECMA 323 ed4. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Private_Data_Schema_ECMA323_ed4.xsd"-->

<!-- OpenScape Voice V3.1 and higher - exposes ECMA 354
Application Sessions. -->

<!-- <xsd:import namespace="https://www.g-dms.com/livelink/
livelink.exe?func=ll&objId=31630257&objAction=Browse"
schemaLocation="OSV_CSTA_Extensions_Schema_ECMA354.xsd"-->

<xsd:annotation>

 <xsd:documentation>SiemensPD</xsd:documentation>

</xsd:annotation>

<xsd:complexType name="SiemensPD">

 <xsd:sequence>
```

```
   <!-- This element is used in the Start Application Session
and Reset Application Session Timer. It is used by the
application to set the Application Heartbeat Timer-->

<xsd:element name="requestedHBT " type="xsd:string"
minOccurs="0" />

<!-- This element is used in the Start Application Session
Respons and Reset Application Session Timer. It is used to
inform the application of the actual time value for the
Application Heartbeat Timer-->

<xsd:element name="actualHBT " type="xsd:string" minOccurs="0" /
>

</xsd:sequence>

</xsd:complexType>

</xsd:schema>
```

D.5 Single Step Transfer to Voice Mailbox

This service is not recommended for Enterprise applications and is supported for backward compatibility only. This service is used to transfer a connection directly to the voice mailbox of a OpenScape Voice subscriber.

```
<?xml version="1.0" encoding="utf-8"?>

<SingleStepTransferCall>

  <activeCall>

    <deviceID>5619231439</deviceID>

    <callID>FF00010000000000362A6946A7120000</callID>

  </activeCall>

  <transferredTo>31762</transferredTo>

  <extensions>

    <privateData>

      <private>

        <scx:transferTarget xmlns:scx="http://www.siemens.com/
schema/csta">transferToVM</scx:transferTarget>

      </private>

    </privateData>

  </extensions>

</SingleStepTransferCall>
```

D.6 Application Session with HBT ECMA 3.2.3 Edition 3 or 4

Application session services (refer to Section 4.5, “Application Session Services”) provides for a private extension for requestedHBT and actualHBT Heartbeat Timer (HBT) that enables OpenScape Voice to provide backup call distribution from an MLHG in the event of an application failure. The following schema may be used.

D.6.1 Start-application Session

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.ecma-international.org/
standards/ecma-354/appl_session" xmlns:tns="http://www.ecma-
international.org/standards/ecma-354/appl_session"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <xsd:annotation>
    <xsd:documentation>Ecma-Start-Application-Session</
xsd:documentation>
  </xsd:annotation>
  <xsd:element name="StartApplicationSession">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="applicationInfo">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="applicationID"
type="xsd:string"/>
              <xsd:element name="applicationSpecificInfo"
minOccurs="0">
                <xsd:complexType>
                  <xsd:sequence>
                    <xsd:any namespace="##any"
maxOccurs="unbounded"/>
                  </xsd:sequence>
                </xsd:complexType>
              </xsd:element>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="requestedProtocolVersions">
          <xsd:complexType>
```

```
            <xsd:sequence>
              <xsd:element name="protocolVersion"
type="xsd:string" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="requestedSessionDuration"
type="xsd:integer" minOccurs="0"/>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="StartApplicationSessionPosResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="sessionID" type="xsd:string"/>
        <xsd:element name="actualProtocolVersion"
type="xsd:string"/>
        <xsd:element name="actualSessionDuration"
type="xsd:integer"/>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="StartApplicationSessionNegResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="errorCode">
```

```
            <xsd:complexType>
              <xsd:choice>
                <xsd:element name="definedError">
                  <xsd:simpleType>
                    <xsd:restriction base="xsd:string">
                      <xsd:enumeration
value="invalidApplicationInfo"/>
                      <xsd:enumeration
value="requestedProtocolVersionNotSupported"/>
                      <xsd:enumeration
value="serverResourcesBusy"/>
                      <xsd:enumeration value="maxNumberSessions"/>
                    </xsd:restriction>
                  </xsd:simpleType>
                </xsd:element>
                <xsd:element name="applError" type="xsd:string"/>
              </xsd:choice>
            </xsd:complexType>
          </xsd:element>
          <xsd:element name="extensions" minOccurs="0">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:any namespace="##any" maxOccurs="unbounded"/>
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
</xsd:schema>
```

D.6.2 Stop-application Session

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.ecma-international.org/
standards/ecma-354/appl_session" xmlns:xsd="http://www.w3.org/
2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <xsd:annotation>
    <xsd:documentation>Ecma-Stop-Application-Session</
xsd:documentation>
```

```
  </xsd:annotation>
  <xsd:element name="StopApplicationSession">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="sessionID" type="xsd:string"/>
        <xsd:element name="sessionEndReason">
          <xsd:complexType>
            <xsd:choice>
              <xsd:element name="definedEndReason">
                <xsd:simpleType>
                  <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="normal"/>
                  </xsd:restriction>
                </xsd:simpleType>
              </xsd:element>
              <xsd:element name="appEndReason"
type="xsd:string"/>
            </xsd:choice>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="StopApplicationSessionPosResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
```

```
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="StopApplicationSessionNegResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="errorCode">
          <xsd:complexType>
            <xsd:choice>
              <xsd:element name="definedError">
                <xsd:simpleType>
                  <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="invalidSessionID"/>
                  </xsd:restriction>
                </xsd:simpleType>
              </xsd:element>
              <xsd:element name="applError" type="xsd:string"/>
            </xsd:choice>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
</xsd:schema>
```

D.6.3 Reset-application Session

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.ecma-international.org/
standards/ecma-354/appl_session" xmlns:xsd="http://www.w3.org/
2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
```

```
  <xsd:annotation>
    <xsd:documentation>Ecma-Reset-Application-Session-Timer</
xsd:documentation>
  </xsd:annotation>
  <xsd:element name="ResetApplicationSessionTimer">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="sessionID" type="xsd:string"/>
        <xsd:element name="requestedSessionDuration"
type="xsd:integer" minOccurs="0"/>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="ResetApplicationSessionTimerPosResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="actualSessionDuration"
type="xsd:integer"/>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="ResetApplicationSessionTimerNegResponse">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="errorCode">
          <xsd:complexType>
```

```
            <xsd:choice>
              <xsd:element name="definedError">
                <xsd:simpleType>
                  <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="invalidSessionID"/>
                    <xsd:enumeration
value="serverCannotResetSessionTimer"/>
                  </xsd:restriction>
                </xsd:simpleType>
              </xsd:element>
              <xsd:element name="applError" type="xsd:string"/>
            </xsd:choice>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
</xsd:schema>
```

D.6.4 Application-session-terminated

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema targetNamespace="http://www.ecma-international.org/
standards/ecma-354/appl_session" xmlns:xsd="http://www.w3.org/
2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <xsd:annotation>
    <xsd:documentation>Ecma-Application-Session-Terminated</
xsd:documentation>
  </xsd:annotation>
  <xsd:element name="ApplicationSessionTerminated">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="sessionID" type="xsd:string"/>
```

```
        <xsd:element name="sessionTermReason">
          <xsd:complexType>
            <xsd:choice>
              <xsd:element name="definedTermReason">
                <xsd:simpleType>
                  <xsd:restriction base="xsd:string">
                    <xsd:enumeration value="resourceLimitation"/
>
                    <xsd:enumeration
value="sessionTimerExpired"/>
                  </xsd:restriction>
                </xsd:simpleType>
              </xsd:element>
              <xsd:element name="serverTermReason"
type="xsd:string"/>
            </xsd:choice>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="extensions" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:any namespace="##any" maxOccurs="unbounded"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
</xsd:schema>
```

D.7 MonitorStart with Application Session ID

Application session service (refer to Section 4.5, “Application Session Services”) establishes a sessionID that enables OpenScape Voice to provide an application exclusive call distribution from an MLHG. When an application supplies its sessionID in an MLHG Pilot monitor start request, OpenScape Voice only permits call control services from that application.

```
<?xml version="1.0" encoding="utf-8"?>
<MonitorStart>
  <monitorObject>
```

```
    <deviceObject>15615631001</deviceObject>
  </monitorObject>
  <requestedMonitorFilter>
    <callAssociated>
      <callInformation>true</callInformation>
      <charging>true</charging>
      <digitsGenerated>true</digitsGenerated>
      <telephonyTonesGenerated>true</telephonyTonesGenerated>
      <serviceCompletionFailure>true</serviceCompletionFailure>
    </callAssociated>
  </requestedMonitorFilter>
  <monitorType>device</monitorType>
  <extensions>
    <privateData>
      <private>
        <scx:sessionID xmlns:scx="http://www.siemens.com/schema/
csta">9</scx:sessionID>
      </private>
    </privateData>
  </extensions>
</MonitorStart>
```

E MLHG and CSTA Capabilities

OpenScape Voice Hunt Group (a.k.a., Multi-line Hunt Group - MLHG) service enables calls to be routed to an available member within the group. Hunting occurs only when the called device is the Hunt Group pilot DN. The pilot DN may be a provisioned only subscriber DN or a SIP subscriber DN (pilot master). Calls placed directly to a member of the group, with the exception of a pilot master will not hunt and are considered private calls. A private call makes the hunt group member unavailable for hunt group calls.

Hunt Group members must be subscribers within the same Business Group as the Hunt Group pilot DN.

When a call is placed to a hunt group pilot DN hunting begins according to the hunt type assigned to the group; linear, circular (with memory), uniform call distribution (UCD) or manual (or CTI controlled). Calls are distributed to the first available member according to the rules of the hunting type. If all members in the group are busy for hunted calls then depending on the hunt group provisioning the call may receive busy treatment or queued until an agent is available. Queued calls provide audible indication to the calling party, such as ringback or announcement. Announcements may include periodic queue position notification.

A Hunt Groups pilot DN provisioned for CSTA enables applications to monitor and distribution calls. CSTA supports call distribution to members or non-member (e.g., private network or public network destinations). Backup call distribution is provided by OpenScape Voice in the event that the hunt group controlling application fails or intentionally taken off-line.

Hunt Group pilot DN provisioned for One Number Service (ONS) is also possible but has not yet been fully tested with OpenScape UC.

There are several Hunt Group attributes that, with proper provisioning, enhance hunting, queuing, announcements, night service, member capabilities, and subscriber re-routing.

The following subsections define the currently supported hunt group attributes.

E.1 Basic Hunt Group Attributes

E.1.1 Hunt Group – Pilot DN

- To provision pilot DN with CSTA and ONS the pilot DN must currently be a provisioned only subscriber DN. This means master pilot DN and CSTA are mutually exclusive.
- The DN may be public or internal.

- Multiple pilots DN are possible by provisioning several DN with Remote Call Forwarding (RCF) to a single pilot DN.

E.1.2 Hunting and Distribution types (Hunting Algorithms)

- Linear – Hunting begins from first to last member. Distribution is made to the first available member.
- Circular (with memory) – Hunting begins from member after last member to receive call and continues in circular fashion. Distribution is made to the first available member.
- Uniform Call Distribution (UCD) – Hunting begins at the member that has been idle the longest and continues to the next agent that has been idle longer than all others and so on. Distribution is made to the first available member.
- Manual (CSTA Application Controlled) – Inbound calls are immediately queued waiting for the application to distribution calls to agents or destinations. Also see Backup Call Distribution.

Note: Hunt Group Calls may NOT be deflected with binding using hunt group pilot as the ONS.
Hunt Groups may be used as preferred devices (OND) to hold calls, for example IBM “Ask Me” queue.

Attention: One Number Service (ONS) is internal to Siemens Enterprise Communications. Refer to Appendix F, “One Number Service (ONS)” for details.

E.1.3 Queuing Attributes

E.1.3.1 Maximum Queue size

This defines the maximum number of calls that may be queued to the group depending on the configured queue size.

E.1.3.2 Configured Queue size

Configured queue size must be greater than or equal to maximum queue size. This defines the actual number of calls that may be queued to the group.

E.1.3.3 Queue Priority

Value (1 to 255) determines the queue search order when an agent is a member of multiple groups. The lower the number the higher the priority.

E.1.3.4 Overflow Destination

Defines where call should be moved if the Queue is full or the call has spent the maximum configured time in queue. For example, this could be group voice mail.

E.1.3.5 Maximum Time In Queue

Defines the maximum time a call remains in queue before being moved to the Overflow Destination.

E.1.3.6 Intercept Announcement

Defines the intercept treatment provided to the calling device when the call is queued.

E.1.3.7 Queue Position Announcement Interval and Queue Position Announcement

The interval defines when a queued call is moved to the Queue Position Announcement and then returned to the intercept announcement.

E.1.3.8 Maximum Time In Queue

Defines the maximum time a call remains in queue before being moved to the Overflow Destination.

E.1.4 Hunting Attributes

E.1.4.1 No Answer Advance

Defines the duration that a distributed call will alert the selected member until the call is returned to the group to be hunting to another available member.

The auto make busy attribute may be used to cause the member to be made busy for subsequent hunt group calls.

Note: This attribute will have an impact on the UC application's rules and device list processing. Setting the timer too low may cause the hunt group process to divert the call back to the group and re-hunt. This will cause the UC application to loose control of the call much like phone call forwarding.
The No Answer Advance attribute is suspended for calls that are distributed by the UC application (manual mode).

E.1.4.2 Auto Make Busy

If No Answer Advance timer expires this attribute determines if the alerted member should automatically be made busy.

The member remains busy for hunt group calls until manually changed.

E.1.4.3 Post Call Time (e.g., Wrap-up)

Defines how long after a member has answered a call does the member remain temporarily not available for a hunted call. This attribute affects agent "working after call" state.

Note: This option is not used applied to calls that are distributed by the UC application. Application may set "working after call" via Agent State services.

E.1.4.4 Collect Traffic Measurement Data

Activates the collection of CDR traffic data for the group.

E.1.5 Night Service Attributes

E.1.5.1 Enable Night Service

Activates or deactivates Night Service for the group. When active calls are not hunted but instead are moved to either the provisioned Night Service Directory Number or Overflow Destination. If neither is provisioned then busy treatment is applied.

Note: It is possible to activate / deactivate night service via CSTA logical device service Set Do Not Disturb. CSTA Get Do Not Disturb is also supported for hunt group pilot.

E.1.5.2 Night Directory Number

Destination where calls are routed if Night service is enable. This number may be internal or off-network.

E.1.5.3 Attendant

If set this option directs all incoming call to the system attendant number.

E.1.6 Member / Agent Attributes

E.1.6.1 Subscriber ID

Defines the OpenScape Voice subscriber that is a member of the hunt group.

E.1.6.2 Position

Defines the position in the hunt group that a member is assigned. This determines the hunting order in a linear hunting arrangement.

E.1.6.3 Queue Priority

Defines member's queue priority used if member is provisioned in multiple hunt groups.

E.1.6.4 Busy Status

Sets and/or indicates the Hunt Make Busy Status of the member. Busy agents are not hunted.

Note: Busy status may be set via CSTA Set Agent – Ready or Not Ready. The CSTA Get Agent State service is also supported.

E.1.6.5 Busy Stop Hunt

Sets and/or indicates the Stop Hunt status of the member. If active hunting stops at this member.

E.1.6.6 Can Make Hunt Group Busy

Activate or deactivates permission for a member to activate the Hunt Make Busy feature.

E.1.6.7 Can Stop Hunt Group Hunting

Activate or deactivates permission for a member to activate the Stop Hunt feature.

E.1.6.8 Attendant

Enables or disables CSTA agent state event flow for this member.

E.1.7 Subscriber Re-routing Attribute

E.1.7.1 Enable Re-routing

Enables hunt group calls to provide subscriber re-routing during conditions of WAN outage or CAC limitations.

Note: Subscriber re-routing adds additional PSTN charges to the call.

E.1.8 Calling Party Display

Note: In a future release the administrator will have the option to configure a subscriber that is a MLHG member to use the Name and Number of the Main Pilot DN as the subscriber's identity for Internal and/or External calls.

For calls distributed from the hunt group, if the calling party is an internal subscriber the number of the hunt group pilot number will be displayed on the phone and provided via CSTA events.

For outbound calls from an agent the Main Pilot DN (first MLHG in agents list) will be presented as the user's identity. If the called party is external and the Main Pilot DN is internal then the BG Main Number is used.

E.1.9 Manual (Application Controlled) Hunting and Backup Call Distribution (BCD)

Backup Call Distribution (BCD) requires that the application support Application Session Services and the private extension for applicationHeartbeat timer.

BCD applies to a Hunt Group provisioned for Manual (Application Controlled) hunting type.

BCD is active while no CSTA monitor has been started on the hunt group's pilot DN.

When BCD is active all inbound calls will be automatically distributed flowing UCD hunting method.

Once a CSTA monitor has been started on the hunt group's pilot DN BCD is deactivated and calls are queued waiting for the application to distribute calls to member or elsewhere.

F One Number Service (ONS)

One Number Service (ONS) is an extension of the OpenScape Voice CSTA interface. It is Siemens Enterprise Communications specific, and is used exclusively between OpenScape Voice and OpenScape UC Application to create, route, track and, control inbound and outbound calls via standard CSTA call control services for any device located anywhere.

When ONS connections are created, the “device identification” is extended to include a One Number Service Device (OND) tag. ONS is the logical OpenScape Voice subscriber identity used to provide call control services. OND is the directory number of the physical device used for the media; this may be another OSV subscriber device or external (off-net) device.

Within the CSTA event flow, device IDs may be presented on device monitors with an “ond” tag.

Note: Third Party Applications must accept the deviceID string with the “ond” tag. This conforms to the ECMA 269 CSTA connection model. The “ond’ tag would not be used and must be ignored by Third Party Applications.

The following xml example illustrates the established connection parameter presentation in an ONS call:

```
<establishedConnection>
    <callID>FF0002000000000006672494DE6040000</callID>
    <deviceID>N&lt;+15557654321&gt;;ond=+15551234567</deviceID>
</establishedConnection>
```

Note: In a connection identifier, the device Name is always presented as an empty string. The “ond” tag begins after the semi-colon (;) in the NM field.

When an ONS connection is cleared, then the Clear Connection service shall include the “ond” tag in the connectionToBeCleared parameter, as illustrated in the xml example below:

```
<?xml version="1.0" encoding="utf-8"?>
<ClearConnection xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://www.ecma-
international.org/standards/ecma-323/csta/ed3">
    <connectionToBeCleared>
        <deviceID> N&lt;+ 15557654321&gt;;ond=+15551234567</deviceID>
        <callID> FF0002000000000006672494DE6040000</callID>
    </connectionToBeCleared>
</ClearConnection>
```

List of Abbreviations

This table shows some important abbreviations.

Abbreviation	Definition
ACD	Automatic Call Distribution; Telephone facility that manages incoming calls and handles them based on the number called and an associated database of handling instruACDs to validate callers make outgoing responses or calls, forward calls to the right party, allow callers to record messages, gather usage statistics, balance the use of phone lines, and provide other services. Many companies offering sales and service support use
AICS	Automatic Incoming Call Selection; called Call Forcing in this document
AIN	Advanced Intelligent Network
API	Application Programming Interface
B50	SEPP milestone at which a feature is defined
BC	Business Connect
BG	Business Group; also called Centrex Group or Tenant Group
BL	Busy Line
BO	Business Opportunity
CAC	Call Admission Control
CALEA	Communications Assistance for Law Enforcement Act (J-STD-025); also known as Lawful Intercept
CAP	Common Application Platform, host platform for Com Assistant
CDR	Call Detail Record
CLI	Command Line Interface
CPE	Customer Premises Equipment
CSTA	Computer Supported Telecommunications Applications; ECMA open-standard interface definition to enable computing systems to control telephony systems (3rd party call control)
CTI	Computer Telephony Integration the interface that enables first or third party application control of voice features.
DB	Database
DD	Dialable Digits
DLS	Download Server for optiPoint endpoints
DN	Directory Number
DNIS	Dialed Number Identification Service
DSS	Direct Station Selection
ECMA	European Computer Manufacturers Association; Maintainers of the CSTA standards
FRN	Feature Request Number (replaces LM Number)
FRU	Field Replaceable Unit (a.k.a. Spare)
FW	Firmware

Abbreviation	Definition
GNF	Global Number Format
GUI	Graphical User Interface
HMB	Hunt Make Busy
OpenScape Voice	Collective name Siemens Enterprise Communications soft switch products. Unless otherwise noted this applies to OpenScape Voice cluster.
HW	Hardware
IKE	Internet Key Exchange
IM	Instant Message
IP	Internet Protocol
IPSec	Internet Protocol Security
IUS	State of an inspected, released document
LAN	Local Area Network
LM	Leistungsmerkmal (German for “Feature”); SNC uses the term FRN instead
Make-Busy	Name only used internally; the OpenScape Voice name for this ACD agent state is Unavailable
MD	Manufacture Discontinue; End of Life for a product
MGCP	Media Gateway Control Protocol; IETF standard RFC 2705
MTA	Multimedia Terminal Adaptor (for example, Packet Cable or MGCP)
MLHG	Multiline Hunt Group
NAA	No Answer Advance (an MLHG feature)
NMC	Network Management Center
OEM	Original Equipment Manufacturer
OND	One Number Service Device
ONS	One Number Service
ONS-IO	One Number Service – Inbound Outbound
OS	Operating System
PC	Personal Computer
PLM	Product Line Management
scx	Siemens Enterprise Communications CSTA Extension – for example, used in privateData and other parameters
SE	Systems Engineering
SFR	Switching Function Representation
SIP	Session Initiation Protocol; an IP-based protocol for distributed applications; IETF standard RFC-3261
SIP IAD	SIP Integrated Access Devices for analog support.
SMU	Staff Month Unloaded
SNMP	Simple Network Management Protocol; IETF standard
SOAP	Simple Object Access Protocol; IETF standard RFC 3288

Abbreviation	Definition
SS7	Signaling System Number 7
SST	Single Step Transfer
SW	Software
TCP	Transmission Control Protocol
TLS	Transparent LAN Service
TTUD	TLS/TCP UDP Dispatcher
uaCSTA	User Agent CSTA Services over SIP transport
UCD	Universal Call Distribution
UI	User Interface
Work	ACD agent state; work state is used by an agent to complete the paperwork associated with a call that has just completed; sometimes referred to as Post-Call or Wrap-up time.
Wrap-up	Name not used; the OpenScape Voice name for this ACD agent state is Work
XML	Extensible Markup Language

The CSTA definitions and abbreviations are defined in ECMA TR/72

Index

U

V