Panasonic

Panasonic PBX - CTI Version 4.000

CSTA Implementation Specification Part 1

Revision 3.1

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Preface

This document describes Panasonic TDA/TDE series PBX CSTA implementation specification. **Version 3.1**

Revision History

Revision	Section	Description	Date
1.0		First release	2002/10/31
1.004	9.2.3 Delivered	TDA Implementation 5 is added.	2003/07/17
	9.2.5 Established	TDA Implementation 1 is added.	
	15.1.1 Call Detail Records Report	TDA Implementation 5 is added.	
	Annex B	DirectedPickupCall and RetrieveCall for SLT are supported.	
	2.2 Protocol Stack	Limitation of InvokeID is added.	
	Annex G Phone Code	Added.	
	Annex A.4 Limitation	Start/Stop Data Collection is changed to A(Not available)	
	9.2.3 Delivered	TDA Implementation 6 is added.	
	15.1.1 Call Detail Records report	TDA Implementation 3 a) External Outgoing Call: Possible value of calledDevice is changed to number only.	
	15.1.1 Call Detail Records report	TDA Implementation 3 b) External Incoming Call: Data type of callingDevice and networkCalledDevice are changed to OtherPaln from NumberDigits.	
	3.9 Device Identifier Format	Description is modified (callingDevice, networkCalledDevice, networkCallingDevice).	
	11.2.2 Ringer Status	Added.	
	A.4	KmeSystemDataChanged for 1st-PartyCTI is changed to A.	
	A.4 *5)	The first sentence is deleted.	
1.005	16.1.12 KmeSetSystemData	TDA Implementation 3 is added.	2003/08/01
	A.4 (2)	Kme Ogm Start and Stop are changed to C.	
1.006	9.1.9 Dial Digits	TDA Implementation 3 is added.	2003/09/09
	C.1 Station(ISDN extension)	Description for CDR is changed.	
1.006a	15.1.1 CDR Report	TDA Implementation 3: "Type" in tables are changed. TDA Implementation 5 is changed. TDA Implementation 6 is added.	2003/09/26
1.006b	9.1.2 Answer Call	TDA Implementation 6 is added. And case c is changed.	2003/10/09
	9.1.3 Call Back Call-Related	TDA Implementation 7 is added.	
	7.1.1 Monitor Start	Description of actualMonitorFilter in Positive Acknowledgement is changed. TDA Implementation 3 is added.	
	7.1.1 Monitor Start	Description of actualMonitorFilter in Positive Acknowledgement is changed. TDA Implementation 3 is added.	
	9.1.8 Deflect Call	ogmContinuation is added to privateData in Request.	
	9.2.3 Delivered	privateData(device) is added.	
		Event Cuases - timeout is deleted.	
		TDA Implementation 5 is modified.	
	9.2.5 Established	Event Cuases - Description of timeout is modified.	
	16.2.6 KmeSystemDataChanged	vmGMember is added to "System Data".	
	9.1.15 Retrieve Call	Consultation Hold is removed from supported hold types.	
	2.1 Physical Link	Description of First Party Application is modified.	

Revision	Section	Description	Date
1.006c	3.9 Device Identifier Format	Description is modified (callingDevice, networkCalledDevice, networkCallingDevice).	2003/11/11
	Annex A	This section is deleted.	
	3.1.7 Other Category	Description of External ringer and External sensor are deleted.	
	9.2.3 Delivered	TDA Implementation 5 is modified.	
	3.8.5 Prompting	Description is changed.	
1.006d	11.1.1 SetDisplay	Description of physicalBaseRowNumber and physicalBaseColumn are modified.	2003/12/24
		TDA Implementation 4 is modified.	
	9.1.7 ConsultationCall	consultOptions : "Mandatory" is added.	
	KmeSetSystemData	Error Return is modified.	
		TDA Implementation 4, 5 and 6 are added.	
	Annex E	ButtonIDs were wrong. Fixed.	
1.006e	9.2.3 Delivered	TDA Implementation 7 is added.	2004/01/06
1.006f	4.1 AssociationEstablishment	Description of calling-AP-title is changed.	2004/02/06
	9.1.14 Park Call	TDA Implementation 6 is modified (DeviceID for auto park feature is written).	
	2.2 Protocol Stack	Description for 2 bytes header is modified. And TCP port which PBX listening to is added.	
	11.1.1 SetDisplay	TDA Implementation 7(LCD Character code) is added.	2004/03/09
1.006g	15.1.1 CDRreport	TDA Implementation 4 is modified. (more than 4 -> 2)	2004/06/29
	12.1.10 Set Auto Work Mode	Description of autoWorkInterval is changed.	
1.1	9.2.3 Delivered	- broadcastGroupNo is added as privateData. - TDA Implementation 7 is modified.	2004/07/20
	9.2.5 Established	broadcastGroupNo is added as privateData.	
	9.2.9 Originated	broadcastGroupNo is added as privateData.	
	9.2.12 ServiceInitiated	broadcastGroupNo is added as privateData.	
	16.1.7 KmeGetSystemData	whoAmI, broadcastGroup, extName and broadcastGroupMembers are added.	
	16.1.13 KmeSystemDataLinkedReply	you are, extName, broadcastGroup, broadcastGMembers are added.	
	16.2.6 KmeSystemDataChanged	broadcastGMembers is added.	
2.0a	9.1.8 Deflect Call	- ringPattern is added. - TDA Implementation 6-10 are added.	2004/07/20
	9.2.3 Delivered	- didNumber is added as privateData. - TDA Implementation 8, 9 are added.	
	11 Physical Device Features	From 11.1.1 to 11.1.9 and from 11.2.2 to 11.2.4 are added.	
	16.1 Escape Services	- KmeGetSystemDataRevision, KmePDFStart, KmePDFStop, KmeSetProgrammingEventOn are added.	
	16.2 Private Events	KmePDFStatus is added.	
	16.1.7 KmeGetSystemData	pbxType, externalSensor, fcoKey, sxdpMaster are added.	
	16.1.16 KmeSetSystemData	- subdomainName, tenantSpeedDial, distributionMethod, fcoKey are added. - groupType is changed.	
	16.1.17 KmeSystemDataLinkedReply	- length of subdomainName is changed. - pbxType, externalSensor, fcoKey, sxdpMaster are added.	
	16.2.7 KmeSystemDataChanged	subdomainName, fcoKey, sxdpMaster are added.	
	Annex A	Supported Physical Device Features are added.	
	Annex E	Button Map is changed.	
	Annex F	Phone code for IP-PT is added.	
	Annex H	Added.	

Revision	Section	Description	Date
2.0b	9.1.8 DeflectCall	Description of forcedAlerting in Request table is changed.	2004/07/30
2.0c	4.3 Association Failure Report	This section has added.	2004/08/17
	6.1.1 System Status	TDA Implementation 1 is modified.	
	15.1.1 Call Detail Records Report	TDA Implementation 2 is modified.	
	Annex A	Data Collection Service to PS is changed to No.	
	Annex H	Function number for CTI is changed to 0x87	
	Annex I	Added.	
2.0d	11.1.8 Set Ringer Status	Comment below Request table is modified.	2004/09/08
	3.1.7 Other Category	Description of external sensor is added.	
	10.1.1 Generate Digits	TDA Implementation 1 and 2 are modified.	
	11.1.6 Set Lamp Mode	TDA Implementation 2 is modified.	
2.0e	11.1.1 Button Press	TDA Implementation 3 is added.	2004/11/25
	11.1.1 Button Press 11.1.2 Get Message Waiting Indicator 11.1.3 Get Microphone Mute 11.1.4 Get Speaker Volume 11.1.6 Set Lamp Mode 11.1.7 Set Microphone Mute 11.1.8 Set Ringer Status 11.1.9 Set Speaker Volume	In Error Return Table, "MEC" is changed to "SD card for upgrade".	
2.0f	2.3 Message Format	This section is added.	2005/03/16
	6.1.1 System Status	TDA Implementation 5 is added.	
	9.1.8 Deflect Call	TDA Implementation 11 is added.	
	3.1.4 Group Device Category	"ACD Wait Time" is changed to "ctiWaitTime".	
	3.1.5 Routeing Device Category	Description is changed.	
	3.1.6 Voice Unit Category	Description is changed.	
	3.3 Routeing Device	Description is changed.	
	16.1.16 KmeSetSystemData	acdMode, ctiWaitTime is changed to no lock is needed.	
	16.1.7 KmeSetSystemData	Description of number parameter in Speed Dial is modified.	
	3.1.7 Other Category	SVM is added	
2.2	9.2.2 Connection Cleared	CallID is added as privateData	2005/10/24
	9.2.12 Service Initiated	featureNumber is added as a privateData.	
	15.1.1 Call Detail Records Report	TDA Implementation 6 is modified.	
	16.1.7 GetSystemData	TDA Implementation 2 is added.	
2.21	9.2.6 Failed	Reorder Tone is added to Event causes.	2006/06/16
2.22	6.1.1 System Status	TDA Implementation 2 is changed.	2006/08/31
	11.2.5 Ringer Status	TDA Implementation 3 is deleted.	
2.23	9.2.2 ConnectionCleared	TDA Implementation for ConnectionCleared Event on QSIG Transfer by Rerouting is added.	2006/09/28
	9.2.12 ServiceInitiated	TDA Implementation is added.	
	16.1.7 KmeGetSystemData	System Data is added. Kme Device Category is added.	
	16.1.8 KmeGetSystemDataRevision	TDA Implementation is added.	
	16.1.17 KmeSystemDataLinkedReply	Data Structure of KmeGetSystemDataRsp is added.	
	AnnexF: Phone Code	Phone Code is added.	
	AnnexX: How to Get/Set station device information	Port Type is added.	
3.00	Header	"TDA" is changed into "TDA/TDE".	2006/11/30

	11.1.5 Set Display	TDA/TDE Implementation 9 is added	
	13.1.2 Out Of Service	TDA/TDE Implementation 2 is added	
	16.1.17 KmeSystemDataLinkedReply	Data Structure of KmeGetSystemDataRsp is updated.	
	AnnexF: Phone Code	Phone Code is updated.	
3.01	12.1.3 Cancel Call Back Message	TDA/TDE Implementation 3 (behavior of this request during OUS state) is changed.	2007/06/05
	16.1.15 KmeSetSystemData	TDA/TDE Implementation 7 (Max number of dayNightMode) is modified.	
	11.2.1 ButtonPress	TDA/TDE Implementation 1 is modified, 4 is added.	
3.02	16.1.18 KmeTwpWayRec	Description of termination is added.	2007/12/03
	16.1.16 KmeSystemDataLinkedReply	PBX type number for NCP series is added.	
3.10	3.10 Hospitality Features	This section is added.	2007/12/7
	16.1.8 KmeGuestCheckIn	This section is added.	
	16.1.9 KmeGuestCheckOut	This section is added.	
	16.2.3 KmeCheckedIn	This section is added.	
	16.2.4 KmeCheckedOut	This section is added.	
	Annex I	Product numbers for software upgrade are added.	
3.11	10.1.1 Generate Digits	Supported Device is added.	2008/04/14
	10.1.1 Generate Digits	TDA/TDE Implementation 7 is added.	
	11.2.1 Button Press	Description of buttonLable parameter is fixed.	
	Annex F	Phone code of ISDN and OPX are fixed.	
3.12	16.1.16 KmeRoomCleanUp	Added.	2008/08/25
	16.2.5 KmeCleanUpNotReady	Added.	
	16.2.6 KmeCleanUpReady	Added.	

Table of Contents

1. Introduction

ECMA defines Computer Supported Telecommunications Applications (CSTA) as a protocol between a computing network and a telecommunications network. Now there are 3 kinds of Phases from Phase I to Phase III, the KX-TDA/TDE series use CSTA Phase III as a protocol.

This documentaiton describes an implementation of CSTA Phase III with the KX-TDA/TDE PBX. The implementation is based upon the standards described in the following documentation:

ECMA-269 Services for Computer Supported Telecommunications Applications (CSTA)
Phase III 4th Edition - June 2000

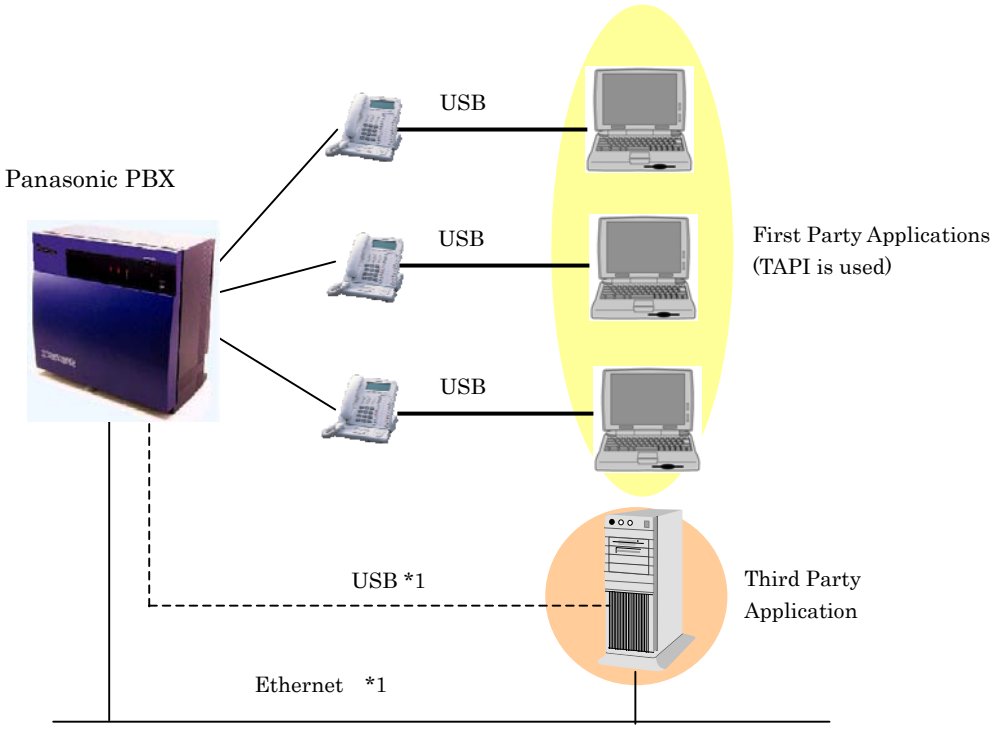
ECMA-285 Protocol for Computer Supported Telecommunications Applications (CSTA)
Phase III 2nd Edition - June 2000

2. Protocol Stack

2.1. Physical Link

The Panasonic PBX has 3 physical interfaces as the CT Link described below:

Physical Interfaces	Max. Number of Physical Port	Remarks
Ethernet (TCP/IP)	1	For the Third Party Application
USB (a port on the main unit)	1	For the Third Party Application
USB (an expansion port on the proprietary telephone)	Depending on the number of extensions implemented.	For the First Party Application(TAPI)

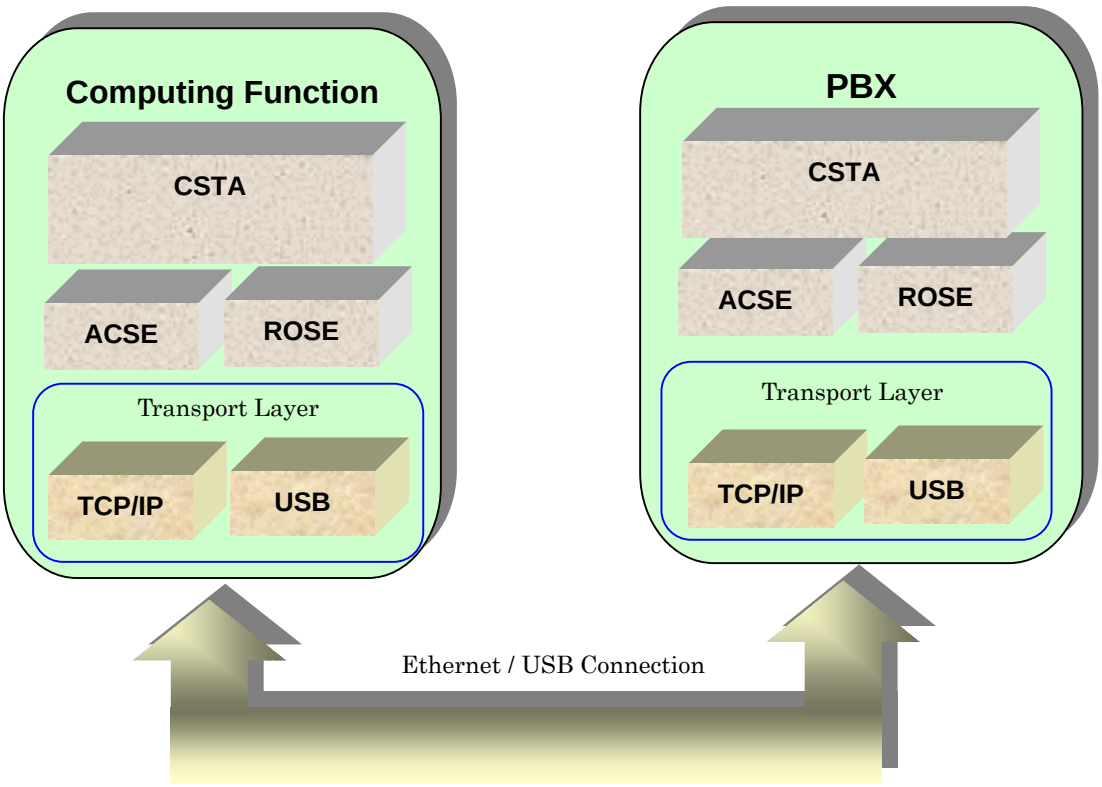


*1 The Panasonic PBX supports a maximum of 1 Third Party Application established either by the Physical Link through the Ethernet or by that using the USB port of the main unit.

2.2. Protocol Stack

The following figures out the configuration of the protocol stack when connecting a computing function to the Panasonic PBX. The message from CSTA is encapsulated to the protocol data unit (PDU) of Remote Operation Service Element (ROSE).

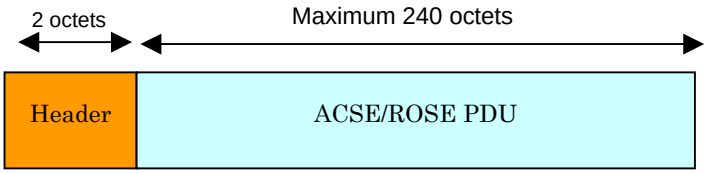
The Panasonic PBX has TCP and USB as the Transport Layer of the CT Link.



ACSE : Association Control Service Element

2.3. Message Format

The computing function necessarily puts a 2-byte header on the beginning of ACSE/ROSE PDU when bringing over the PDU to the Transport Layer (see below). This message is called SPDU (Sesssion Protocol Data Unit). The length of the ACSE or ROSE PDU should be set to the header with network byte order.



2.4. How to build an SPDU Exmaple :MakeCallArgument

Following steps are

Step 1. Find ASN.1 Definition in ECMA-285

```
MakeCallArgument ::= SEQUENCE
{ callingDevice           DeviceID,
calledDirectoryNumber     DeviceID,
~~accountCode              [0] IMPLICIT AccountInfo OPTIONAL,~~
~~authCode                 [1] IMPLICIT AuthCode OPTIONAL,~~
~~autoOriginate            [3] IMPLICIT AutoOriginate DEFAULT prompt,~~
~~correlatorData           [2] IMPLICIT CorrelatorData OPTIONAL,~~
~~userData                 UserData OPTIONAL,~~
~~callCharacteristics      CallCharacteristics OPTIONAL,~~
~~mediaCallCharacteristics [4] IMPLICIT MediaCallCharacteristics OPTIONAL,~~
~~callingConnectionInfo    [5] IMPLICIT ConnectionInformation OPTIONAL,~~
~~extensions               CSTACommonArguments OPTIONAL~~}
```

Strike-through means “Not supported” by TDA PBX

Step 2. Set parameter values for CSTA PDU

```
MakeCallArgument ::=
{
   callingDevice.deviceIdentifier.dialingNumber = "104",
   calledDirectoryNumber.deviceIdentifier.dialingNumber = "101"
}
```

Step 3. Encode CSTA PDU with Basic Encoding Rule

```
300E3005 80033130 34300580 03313031
```

Step 4. Encode ROSE parameter values with encoded CSTA PDU

```
ROSE ::= invoke :
  {
     invokeId = 121,
     opcode.local = 10,
     argument '300E3005800331303430058003313031'H
  }                              Encoded CSTA PDU
```

Step 5. Encode ROSE PDU with Basic Encoding Rule

```
A1160201 7902010A 300E3005 80033130 34300580 03313031
```

Step 6. Add 2 octets header (SPDU is completed)

```
0018 A1160201 7902010A 300E3005 80033130 34300580 03313031
```

Note
1. If PBX receives a PDU(Protocol Data Unit) whose length is more than 240 bytes, PBX discards it without any response.
2. PBX does not accept a ROSE PDU whose InvokeID is more than 32767(0x7FFF). Such PDU causes a UniversalFailure.
3. TCP port which PBX listening to is 33333 in default. This is configurable by TDA/TDE Maintanace Console (Menu: 1.Configuration - 1.Slot - CTI Link).

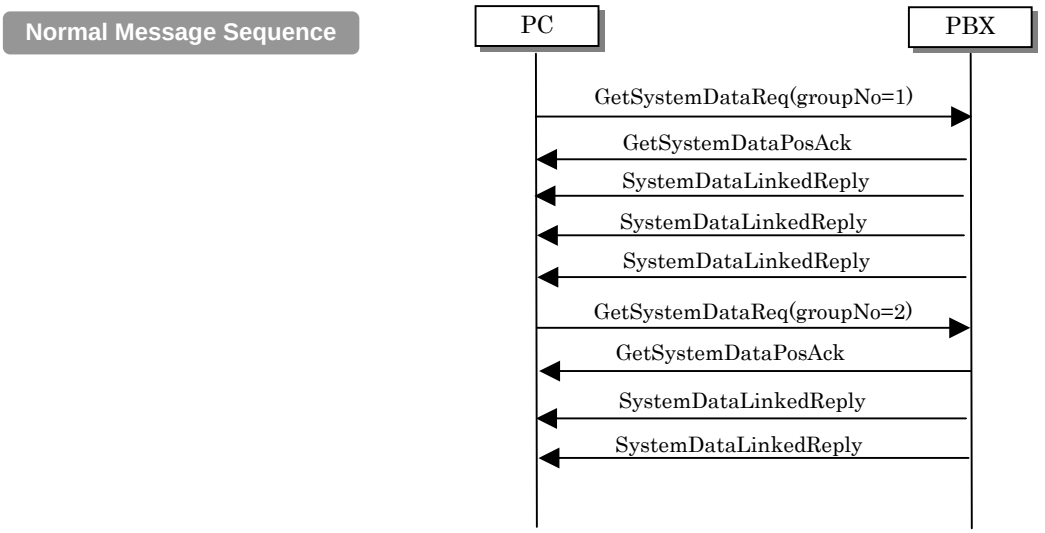
2.5. GetSystemData Wild Card

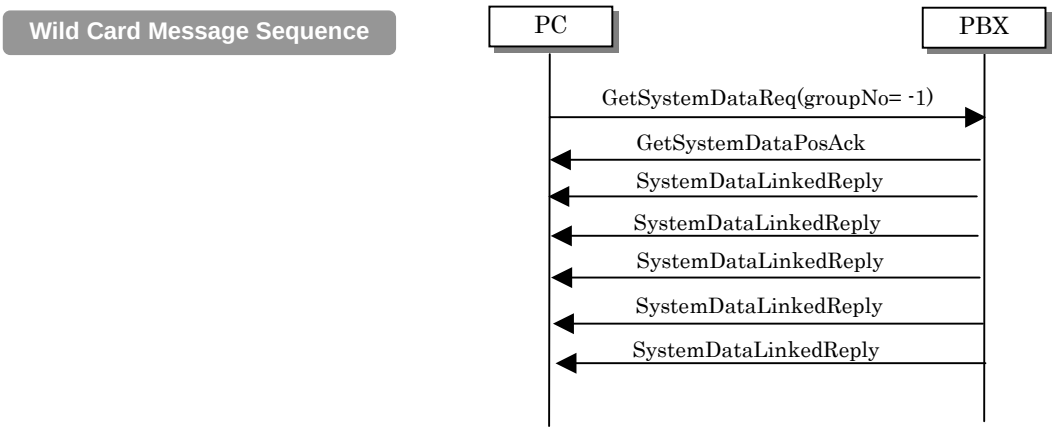
TDA/TDE600 supports GetSystemData wild card for speeding up data transfer. Once the computing function sets wild card value in the following services, the PBX returns a series of GetSystemDataLinkedReplys.

Requests which compressing is available	Parameter (Data Type)	How to specify	
		Length	Value
Extension Group Members	groupNo(INTEGER)	1	-1
Trunk Group Members	groupNo(INTEGER)	1	-1
Incoming Group Members	grpDevice(DeviceID)	0	N/A
deviceData	device(DeviceID)	0	N/A

*1 Data type of deviceData should be NumberDigits type.

Following figure shows the difference of message sequence between normal GetSystemData and GetSystemData with wild card.





3. TDA/TDE PBX Operational Model

3.1. Device Model

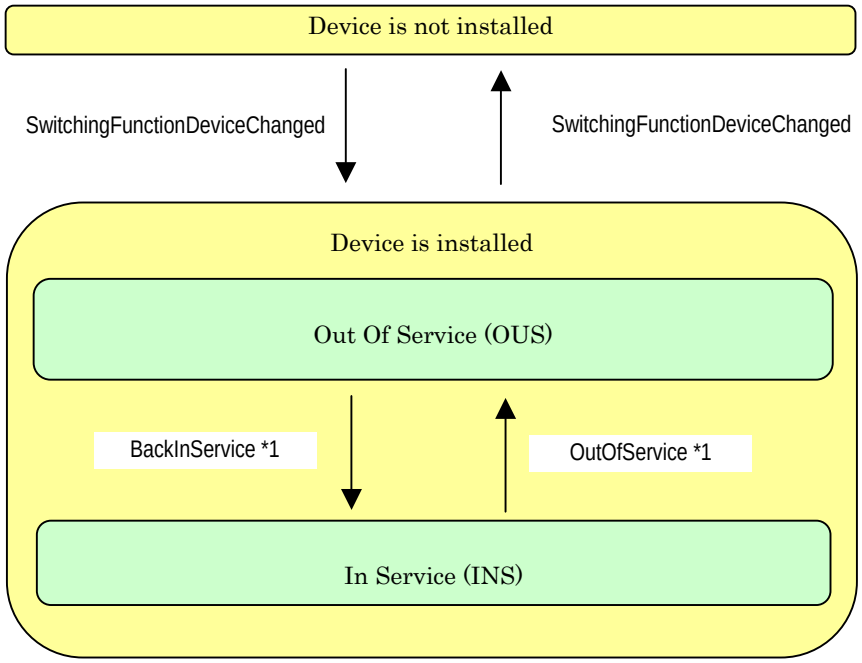
3.1.1. Station Device Category

This category of device can range from a basic "Plain Old Telephone Set" (POTS) device to a very complex feature telephone device.
The devices that belong to this category are shown below. The computing function acquires these classification with the GetSystemData of the Escape service.

- Single line telephone
- Analogue proprietary telephone
- Digital proprietary telephone except for KX-T16 series
- KX-T76 series digital proprietary telephone
- Voice processing system (Incontrollable)
- ISDN telephone
- Wireless telephone except for KX-TD7590 and KX-TD7690
- KX-TD7590 or KX-TD7690 wireless telephone

If the station device is ISDN station, DeviceID format is different. Please refer to 3.9 Device Identifier Format.
When a wireless station is set as SXDP, there is limitation on monitoring alerting call.

Station Device State Transition



*1 Monitor Start is needed.

3.1.2. Network Interface Device Category

A Network Interface Device is a category of device which is within the switching sub-domain and is connected to another telephone network.

3.1.3. Park Device Category

The park device category is a logical-element-only device which is used to park a call. There are one hundred park devices in a system. A maximum of one call can be parked to a park device.

3.1.4. Group Device Category

The incoming group device belongs to this category. Each incoming group has a type as the property. The type which is depending on the call distribution algorithm, can be one of the following: RING, HUNT, or UCD.

The device has the ACD mode as the property. If the ACD mode is turned on, the PBX does not distribute the incoming calls, but leave it to a computing function. If the computing function does not issue a call control request within the pre-programmed time (ctiWaitTime), the PBX distributes the calls depending on the receiving types.

The ACD group device is defined to be the incoming group device on and after.

Event sequences regarding group are TDA/TDE proprietary. Please refer to TDA/TDE scenario section 14. This group is called "Incoming Group".

3.1.5. Routeing Device Category

Routeing device is a queueing mechanism. To move a queued call to another device, DeflectCall is used.

The computing function can see this device only when GetSwitchingFunctionDevices service is requested. When the computing function uses GetSystemData.deviceList, this device is listed in group device category.

This device is another aspect of incoming group. Once acdMode (SystemData) parameter is set true by EscapeService(KmeSetSystemData), it turns into routeing device.

acdMode = on is only available while an association between PBX and PC is established. Once the association is cut, acdMode turns to "off" automatically.

3.1.6. Voice Unit Category

This device is used as a member of Voice Mail Group. Please refer to 3.9 Device Identifier Format.

This device is another aspect of station device. Once value of “DPT Property-Type” parameter of an extension port is changed to “VM(DPT)” by TDA/TDE Maintenance Console, device category of the port changes to Voice Unit from Station.

3.1.7. Other Category

Voice Mail Group (vm)

Voice Mail Group is a logical-element-only device which is used to connect a call to a voice mail system. This is a group device containing member devices. Each member is an extension line connected to a voice mail system whose extension type is "voice processing system" of station device category.
Event sequences regarding group are TDA/TDE proprietary. Please refer to TDA/TDE scenario section 14.
This group is called "Incoming Group".

Door phone (doorPhone)

Door Phone has a single physical element called door openor.
Door openor cannot be monitored Only Escape(KmeDoorOpen) service is available as control.

DISA (DISA)

DISA is a logical-element-only device. This is used by an external caller to access specific PBX features.

Paging group (pagingGroup)

Paging group is a logical-element-only device. Please refer to TDA/TDE scenario (1.14) to see associated events sequence.

PS group (psGruop)

PS group is a logical-element-only device whose member is PS (wireless) device. This group is used for paging.

External pager (externalPager)

External pager has both logical and physical element. But the physical element cannot be monitored, and is incontrollable.
Also no call control services are supported (i.e. Snapshot and monitoring only possible).

Modem (modem)

Modem device is a logical-element-only device which is used for remote maintenance using analog line. No call control services are supported (i.e. Snapshot and monitoring only possible).

Hdlc (hdlc)

Hdlc device is a logical-element-only device which is used for remote maintenance using digital line. No call control services are supported (i.e. Snapshot and monitoring only possible).

System (pbxSystem)

System device is used as a device identifier when an event is originated by the system (e.g. timer).

External Sensor (externalSensor)

External sensor has both logical and physical element. But the physical element cannot be monitored, and is incontrollable.
Also no call control services are supported (i.e. Snapshot and monitoring only possible).

Simlified Voice Message (svm)

SVM is a logical-only device.

3.1.8. Appearance

ISDN extension device and Voice Unit device have call appearances. Appearance is only used in call control events as a part of device identifier for identifying using B-channel and is Non-addressable. Appearance is not available in any service requests. See also Annex C ISDN Implementation.

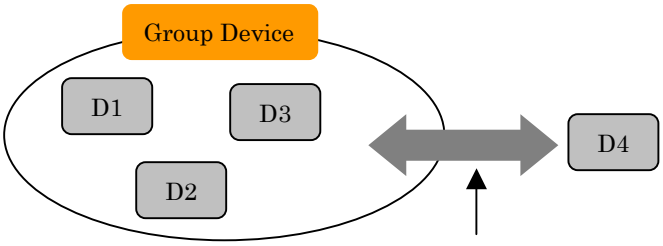
Possible number of appearances is:

ISDN extension	BRI：2, PRI23：23 , PRI30：30
Voice Unit	2

3.2. Agent

An agent represents a device's association and activities with one or more ACD Groups.

An agent becomes a member of a specific Group by using Escape service (SetSystemData) or system programming.



Escape(SetSystemData) Service
Become a member : SetSystemData.sysData.joinGroup
Leave from the group : SetSystemData.sysData.leaveGroup

Note : Do not change the extension number of station device while the station is member of a group.

3.2.1. Agent Identifier

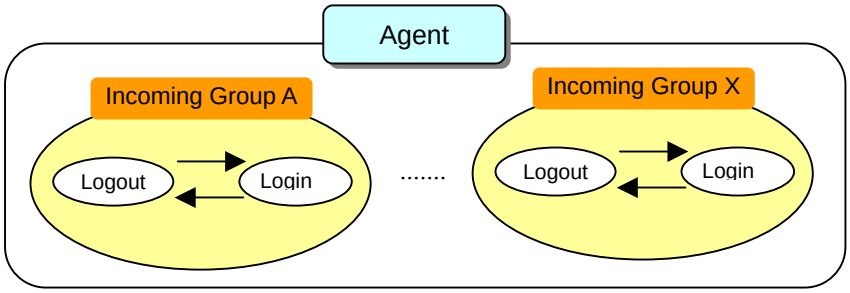
In TDA/TDE PBX, device identifier is used to represent the agent associated with the device.
An agent is associated with more than one incoming group, then the agent identifier is the same.

3.2.2. Agent State Model

The agent state of the PBX transitions depending on the Agent Orientated model, except for LoggedOn/LoggedOff. The LoggedOn and LoggedOff states exist in every group of the related ACD groups. As for the rest of agent states (Ready, NotReady, Busy, and WorkingAfterCall), one state exists per an agent.
The transition of an agent triggers to initiate the event which informs the new state. If, however, the agent logs off from all the ACD groups, the state informing event will not be initiated.

Agent Main State Transition - LoggedOn, LoggedOff

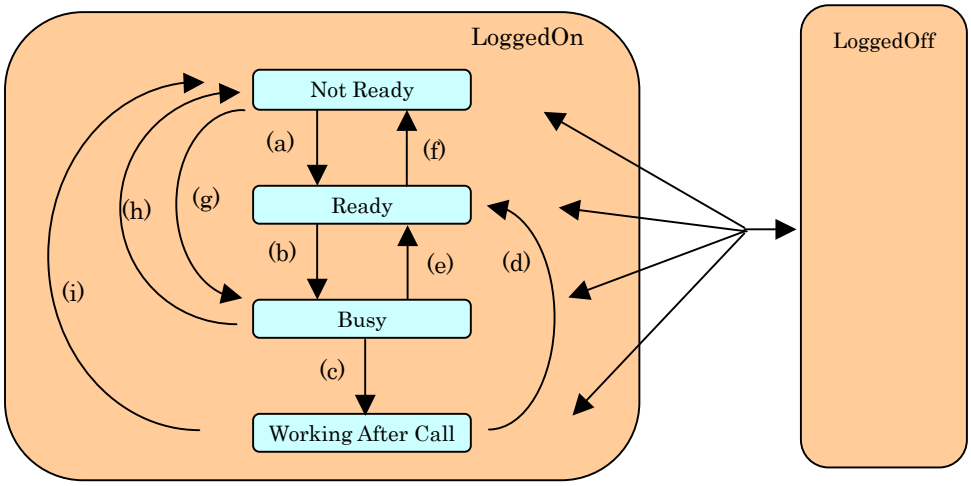
- Each agent has separate state for each belonging group.
- SetAgentState service is used to change main state.
- Once the agent turns to OUS, the main state changes to LoggedOff.



Agent Sub-State Transition - Ready / NotReady / Busy / WorkingAferCall

- Each agent has one sub-state.
- SetAgentState service is used to change sub-state.
- When an agent logs on to a group, the sub-state is Ready by default.

State Transition Figure



State Transition Table

Requested State	Agent State							
	Login				Logout			
	NotReady	Ready	Busy	WAC*	NotReady	Ready	Busy	WAC*
Login	Error				NotReady	Ready	Busy	WAC
Logout	NotReady	Ready	Busy	WAC	Error			
NotReady	NotReady	NotReady	Busy → NotReady	NotReady	NotReady	NotReady	Busy → NotReady	NotReady
Ready	Ready	Ready	Busy → Ready	Ready	Ready	Ready	Busy → Ready	Ready
WAC*	Error				Error			

→ : indicates the sate intergrades after it once was placed in a pending condition.

* : WAC = WorkingAfterCall

Agent State Control

State control method	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Telephone operation by a User	Yes	Yes	Yes	-	-	-	-	Yes	-
With the SetAgentState service	Yes	Yes	Yes	-	-	Yes*	Yes*	Yes	Yes*
Automatic operation by the PBX	-	-	-	Yes	Yes	Yes	Yes	-	Yes

* : Transitions to requested state after it once was placed under the pending condition.

3.3. Routeing Device

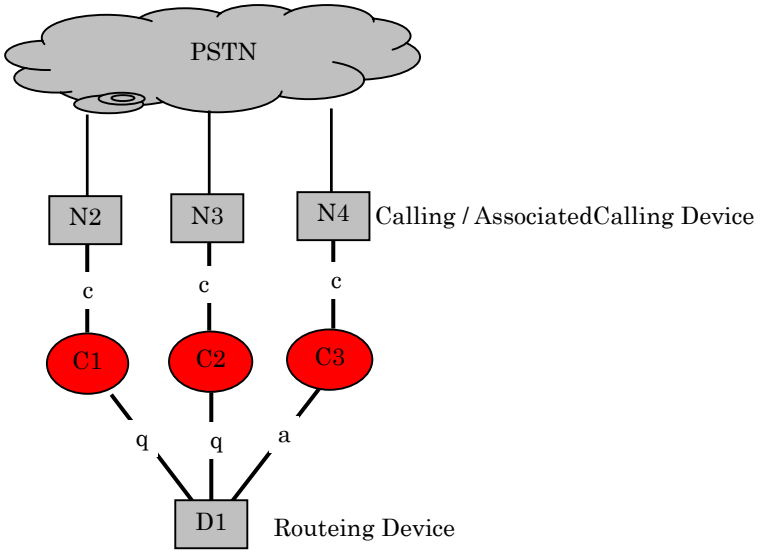
The incoming group of the PBX is equivalent to the ACD Group under the standard CSTA by default. Once the acdMode turns to true, it changes to Routeing Device despite its call distribution type (UCD/RING/HUNT).

Routeing Device behaves as just a queue and does not distribute calls. The computing function needs to control the calls by AnswerCall service and DeflectCall service. AnswerCall service is available to alerting call and it changes the state from alerting to queued. DeflectCall service is available to both alerting call and queued call. **If the computing function does not issue any call control service to an alerting call by ctiWaitTime (default : 5 second), then the PBX controls the call according to the original call distribution type**. ctiWaitTime is a variable which can be changed by EscapeService (KmeSetSystemData). ctiWaitTime could be from 1 to 127 (second) and 0. 0 means infinite.

3.3.1. Connection Model

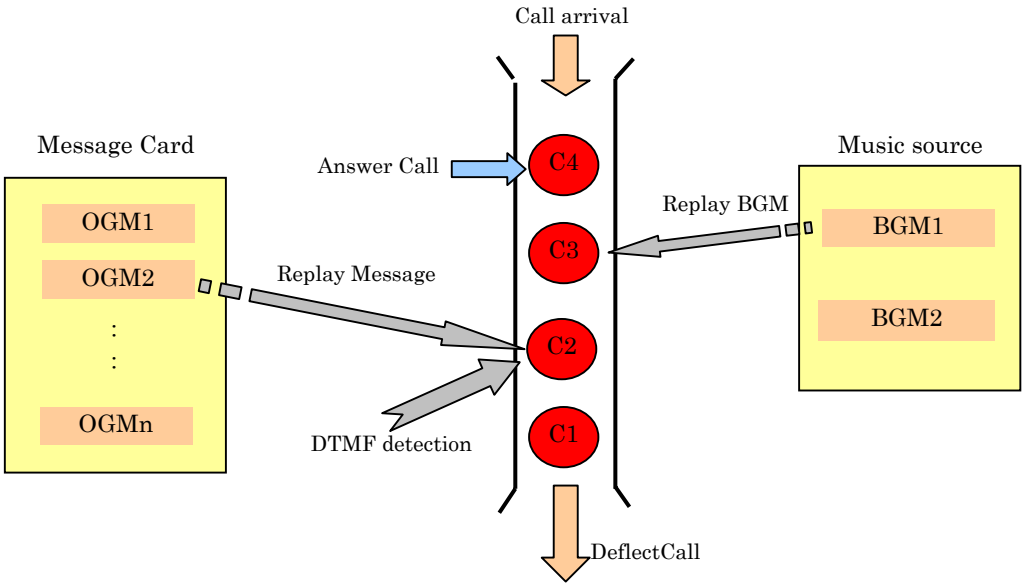
This illustrates three incoming calls are present on a routeing device. It is possible to control any call at the routeing device.

The maximum number of acceptable calls is 255 for total system (not for each device).



3.3.2. Control to queued call

Following service requests are available for queued calls.



Call control services:

AnswerCall	- Answer to an alerting call. Resulting connection state is queued. Any alerting call in the queue can be specified.
DeflectCall	- Redirect the call. This service is available to a connection whose state either alerting or queued. - Any call in the queue can be specified. - It is possible that newDestination is other than a member of the group. But there is difference in event flow between member and non-member.
ClearConnection	- Drop the call.

Resource control services:

GenerateTelephonyTones	- Emits or stops emitting a tone to a queued call. - Replays or stops replaying a sound from a music source to the queued call.
GenerateDigits	- Emits DTMF tones.
KmeOgmStart KmeOgmStop	- Replays or stop replaying a greeting message to the queued call. The started OGM is terminated by DeflectCall service.
StartDataCollection StopDataCollection DataCollected	- Detects DTMF tone to the queued call.

3.4. Voice Unit

3.4.1. Two-way Recording

Records the conversation between 2 parties. The connection model of this feature is a 3 parties conference. Refer to TDA/TDE Scenario section 12.15 to see event sequences. This connection model seems like JoinCall, but this feature is enabled by Escape(KmeTwoWayRec) service.

3.4.2. Voice Mail Transfer

Transfers an active call to the personal mailbox of a Voice Processing System. To enable this feature, it is necessary to set the consultedDevice parameter of the ConsultationCall service to Voice Mail Group. Also the extension number of the mailbox is needed to be set to privateData.

Unlike in the process of normal call transfer, this feature can be initiated **without** issuing the Transfer Call service after the Consultation Call service; the PBX automatically transfers the call to the mailbox.

3.4.3. Live Call Screening (LCS)

Live Call Screening (LCS) is used to monitor user's own voice mailbox while an incoming caller is leaving a message and, if desired, intercept the call.
This feature comprises a conference call. And the originator is Voice Unit. But in this case even voice unit left the call, other two parties continues talking.

3.5. Call Detail Record (CDR) Services

The Call Detail Record (CDR) services allow access to information regarding call details that has been collected, processed and/or stored by the TDA/TDE PBX.

The CDR services support the following:

- Call Detail Records Report
- Start Call Detail Records Transmission
- Stop Call Detail Records Transmission

The transferMode parameter of the Start Call Detail Records Transmission service supports only the transferAtEndOfCall parameter. If there is more than one previously stored CDR reports when requesting this service, the stored CDR Report(s) will be sent after the positive acknowledgement is provided. If a call (C1) is end before the PBX finishes sending all the stored CDR reports, the CDR report of C1 is sent after all the pre-stored reports are sent.

3.6. Capabilities Exchange

The PBX does not support the following Capabilities Exchange services:

- Get Logical Device Information
- Get Physical Device Information
- Get Switching Function Capabilities

3.7. Monitoring

3.7.1. Starting and Stopping a Monitor

- It is possible to start a new monitor on a device whose status is out of service.
- When a device becomes out of service:
  - Existing monitors are not removed.
  - Call control event flows over an existing monitors is stopped.
  - Snapshot Device service results in a negative acknowledgment.

3.7.2. Monitor Objects and Monitor Types

The PBX supports the following Monitor Object and Monitor Type:

Monitor Object	device-object
Monitor Type	device-type

3.7.3. Monitor Filtering

Filter for 3rd party application

TDA/TDE PBX supports monitor filtering, but there is limitation. Among the same device category, each device shall be same monitor filter. The filter set last is valid.

Filter for 1st party application

Each application can have different monitor filter for its own device (extension line).

3.8. Additional services, Feature and Behavior

3.8.1. Forwarding

TDA/TDE PBX supports following forwarding type:

forwardBusyInt
forwardBusyExt
forwardNoAnsInt
forwardNoAnsExt
forwardImmInt
forwardImmExt
forwardBusyNoAnswerInt
forwardBusyNoAnswerExt
(forwardDNDInt)
(forwardDNDExt)

These forwarding types are categorized into two events sequence model:

1. *Forwarding Is Triggered before the Call Is Delivered to the Device*

   forwardBusyInt
   forwardBusyExt
   forwardImmInt
   forwardImmExt

2. *Forwarding Is Triggered after the Call Is Delivered to the Device*

   forwardNoAnsInt
   forwardNoAnsExt

Event sequence of BusyNoAnswer type forwarding depends on which forwarding type (Busy or NoAnswer) is triggered.

3.8.2. Connection Failure

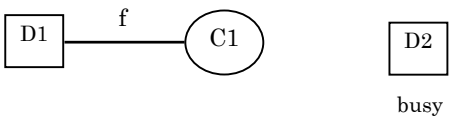
The information indicating connection failure can be reported through several different event sequences. The following are the possible event sequences associated with connection failure:

1. *Negative Acknowledgement* – When the PBX supports service requests that perform connection creation process and the PBX detects a failure, the negative acknowledgement can be used to indicate the failure to complete the connection.
If the PBX uses the negative acknowledgement to indicate the connection failure, then the appropriate error code will be used to indicate the particular failure.

2. *Support of the Failed Event with an Associated Failed Connection* – When the PBX detects a connection failure, it places that connection into the failed state. This indicates that the call control services which can be performed with respect to the connection are limited.
When a connection enters the Failed state, the event sequence provided is a Failed event. The characteristics associated with this event sequence are:
- The Failed event will have an appropriate failure event cause.
- The failedConnection parameter in the Failed event will contain a "complete" Connection Identifier (i.e., a Connection Identifier that has both a Device Identifier and Call Identifier)
- The Failed event will be reported to all active device-type monitors associated with the call, as well as all call monitors associated with the call.

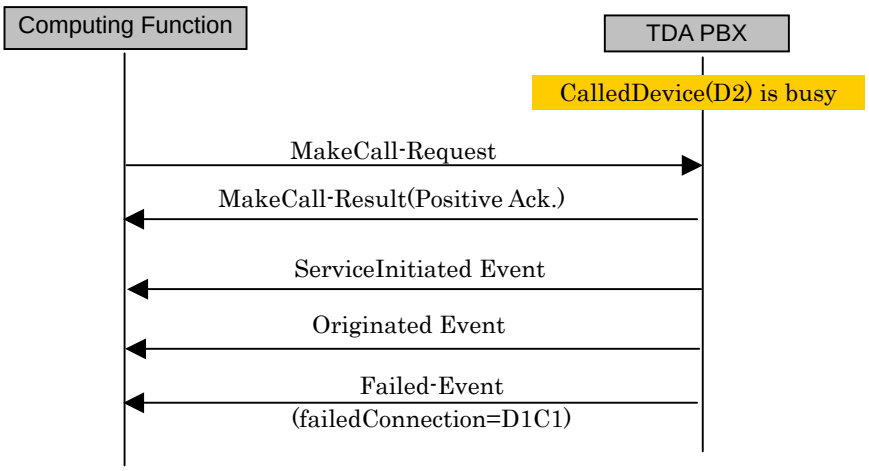
Note

The connection failure model of the PBX which related to call making services like Make Call, does not accord with the standard one of the CSTA. The model would be as below when the connection failed because the target device is Busy or sets the Do Not Disturb feature:



D1 = CallingDevice, D2 = CalledDevice, f = failed state

The event sequence is shown below. Assume that the both D1and D2 has been monitored.



3.8.3. Recall

The Recall feature is a trigger that is associated with a call after a specific call control feature has been executed. When this feature is executed, it redirects or presents the call either back to the device on who's behalf the call control feature was executed or to the PBX administrated destination associated with the specific call control feature. There are several types of call control services which can have this feature associated with them. For example:

- Hold Call
- Transfer Call
- Park Call

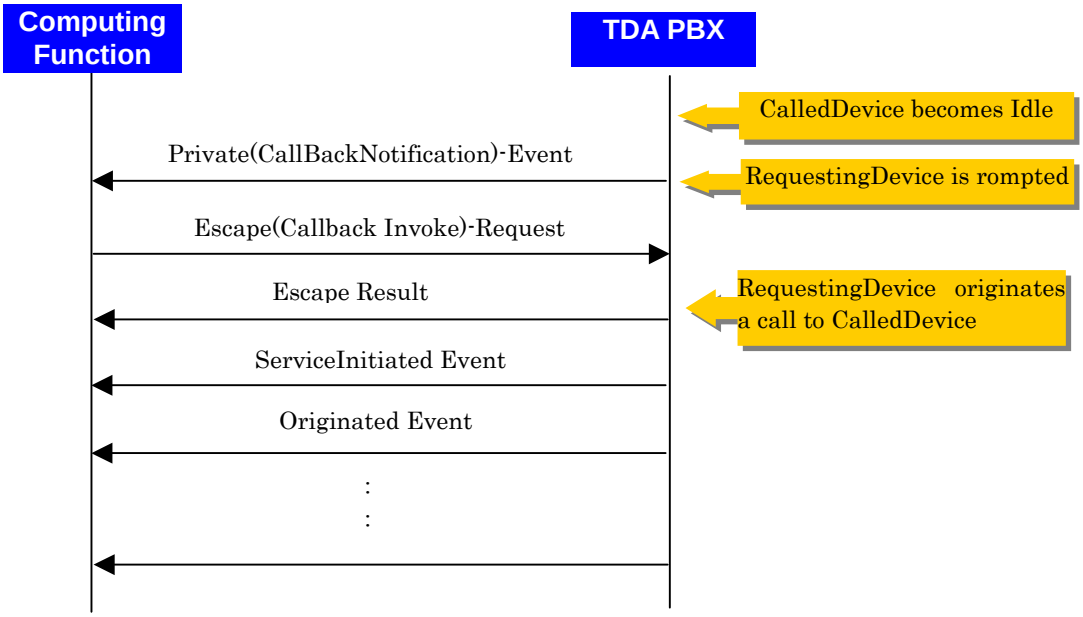
The event sequence associated with this feature is the Diverted event (only if the device to whom the call is being redirected is not already in the call) and the first event associated with the delivery of the call to the new device or the device that performed the call control feature.

The characteristics for this event sequence are:

- The Diverted event will have an appropriate recall event cause. This event is only reported when the device to whom the call is being redirected is not already in the call.
- The first event associated with the delivery of the call to the new device (i.e., Delivered), or the device that performed the call control feature will have an appropriate recall event cause.

3.8.4. Call Back

Event sequence of call back feature will be as follows. It is necessary for the computing function to issue the Escape(CallbackInvoke)-Request or off-hook manually to start making a call from the calling device to the called device.



3.8.5. Prompting

Some CSTA services (Make Call, Call Back) require to prompt the user of the targeted device in order to take that device off-hook. The prompting of the PBX is implemented as ringing or LED blinking.

User can turn off ringing caused by MakeCall request using TDA/TDE Maintenance Console(2.System - 9.Option - 2.Option2 : SLT Ringing for MakeCall(CTI)).

The PBX supports prompting is part of a service as the prompting mode.

Note : ServiceInitiated Event is generated just after off-hook.

3.8.6. Data Collection Services

The Data Collection services are used to collect DTMF information that is received by a device over a connection. This feature is available only when the message card is installed in the PBX.

3.8.7. Hold

The PBX supports the following hold types:

Hold Type	Description	Associated Operations and Services
Normal Hold	The call can be picked up by either with the device which held the call or with another device.	- Press Hold on the telephone set. (*1) - Hold Call service (*1) - Alternate Call service
Exclusive Hold	The call can be picked up only with the device which held the call.	- Press Hold (once or twice) on the telephone set. (*1) - Hold Call service (*1) - Alternate Call service
Consultation Hold	This is in order to progress the Call Transfer feature or the Conference feature.	- Press CONF or TRANSFER on the telephone. - Consultation Call service

(*1) To toggle the Normal Hold feature and the Exclusive Hold feature, repeat pressing the Hold button or repeat initiating the Hold service. The operation may vary depending on the settings of the PBX; e.g., some realises Normal Hold by pressing the Hold button once, and some realises it by pressing the button twice. The PBX sets the hold type to the privateData parameter in the Hold event.

3.8.8. Auto Answer

The auto-answer feature is used to automatically connect to (answer) a call when it arrives at a device, without manual intervention (hands-free mode).

This feature invites a side effect: the connection between the called device and the call will be cleared instead of blocking the call, if the calling device disconnects the connection.

3.9. Device Identifier Format

TDA/TDE PBX uses three kinds of device identifier format.

DeviceID Format	ASN.1 data type
Diallable Digits	NumberDigits
Device Number	DeviceNumber
Switching Function Representation	NumberDigits

Diallable Digits is used for devices in a category which has extension number (e.g. station). Otherwise Device Number is used. Device categories which has extension number is described below.

Device Category	Extension Number
Station	Yes
Network Interface	No
Park	No
Group	Yes
Routeing Device	Yes
Voice Unit	Yes
Voice Mail Group (vm)	Yes
Door Phone	No
DISA	No
Paging Group	No
PS Group	Yes
External Ringer	No
External Sensor	No
External Pager	Yes
Modem	Yes
Hdlc	Yes
System	No

Switching Function Representation is used in the following cases.

a) DeviceID type parameter in events representing ISDN extension device (Always)
b) DeviceID type parameter in events representing Voice Unit (Always)
c) callingDevice and networkCalledDevice parameter in Call Detail Record Reports service
d) networkCallingDevice parameter in Delivered and Established event

In case a) and b), Switching Function Representation is used for identifying using B-channel.

e.g. "N201&2" .... This means : Extension number is "201", using B-channel is 2.

In case c) and d), Caller ID and Caller Name are set as follows.

e.g. "N<0354891001>Matsushita"
Caller ID 0354891001
Caller Name ... Matsushita

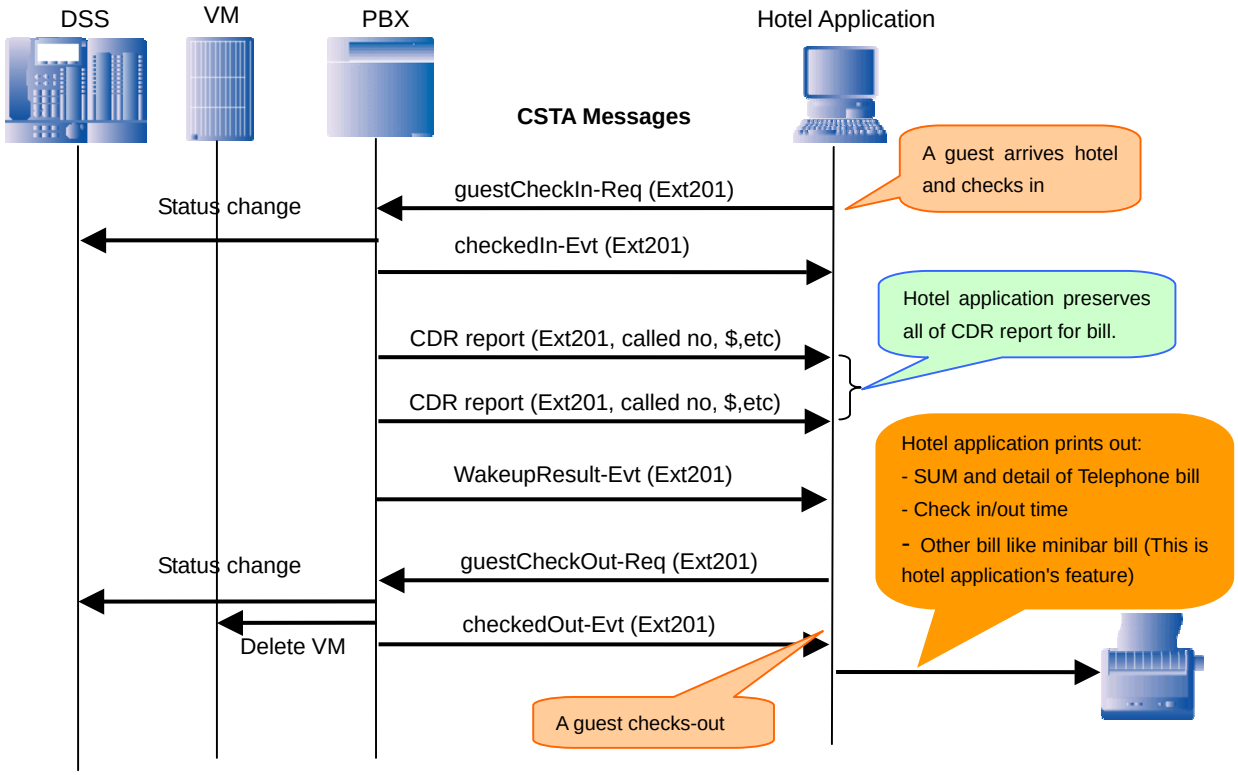
3.10. Hospitality Features

Panasonic PBX has several features that support its use in a hotel-type environment, where extensions correspond to guest rooms. Following table shows relation between hospitality features and CSTA features. See PBX Feature Guide for more detail.

Feature	Description	Related CSTA Features
Room Status Control	An extension designated as the hotel operator can set the check-in status of rooms remotely.	EscapeService & PrivateEvent guestCheckIn-Request * guestCheckOut-Request * cleanup-Request * checkedIn-Event * checkedOut-Event * cleanUpReady-Event * clearnUpNotReady-Event * GetSystemData-Request -guestCheckStatus * GetSystemDataLinkedReply - guestCheckStatus *
Call Billing for Guest Room	Charges for calls from guest rooms can be logged and output as a guest bill.	None
Remote Wake-up Call	An extension designated as the hotel operator can set a timed reminder for a room remotely.	PrivateEvent WakeupResult
SMDR for External Hotel Application	Hospitality feature data, including check-in, check-out, and timed reminder times,can be output to SMDR for use in a PC-based hotel application.	CallDetailRecordsReport StartCallDetailRecordsTransmission StopCallDetailRecordsTransmission

* Supported in CTI version 4.000 or later.

Message Sequence Image



4. Association Establishment

4.1. Association Establishment

TDA/TDE PBX supports "Explicit association realized through the use of ACSE" only.

Supported parameters in ACSE

AARQ-apdu

Parameter Name	M/C/O	TDA/TDE	Description
protocol-version	M	Yes	version1
application-context-name	M	Yes	{ 1 3 12 0 218 }
called-AP-title	O	No	
called-AE-qualifier	O	No	
called-AP-invocation-identifier	O	No	
called-AE-invocation-identifier	O	No	
calling-AP-title	O	No	This is not needed for 3rd party applications.
calling-AE-qualifier	O	No	
calling-AP-invocation-identifier	O	No	
calling-AE-invocation-identifier	O	No	
sender-asce-requirements	O	No	
mechanism-name	O	No	
calling-authentication-value	O	No	
application-context-name-list	O	No	
implementation-information	O	No	
user-information	O	Yes	ACSEUserInformationForCSTA

AARE-apdu

Parameter Name	M/C/O	TDA/TDE	Description
protocol-version	M	Yes	version1
application-context-name	M	Yes	{ 1 3 12 0 218 }
result	M	Yes	accepted(0) or rejected-permanent (1)
result-source-diagnostic	M	Yes	acse-service-user : no-reason-given
responding-AP-title	O	No	
responding-AE-qualifier	O	No	
responding-AP-invocation-identifier	O	No	
responding-AE-invocation-identifier	O	No	
responder-acse-requirements	O	No	
mechanism-name	O	No	
responding-authentication-value	O	No	
application-context-name-list	O	No	
implementation-information	O	No	
user-information	O	Yes	ACSEUserInformationForCSTA Provided only result = accepted.

RLRQ-apdu

Parameter Name	M/C/O	TDA/TDE	Description
reason	O	No	
user-information	O	No	

RLRE-apdu

Parameter Name	M/C/O	TDA/TDE	Description
reason	O	No	
user-information	O	No	

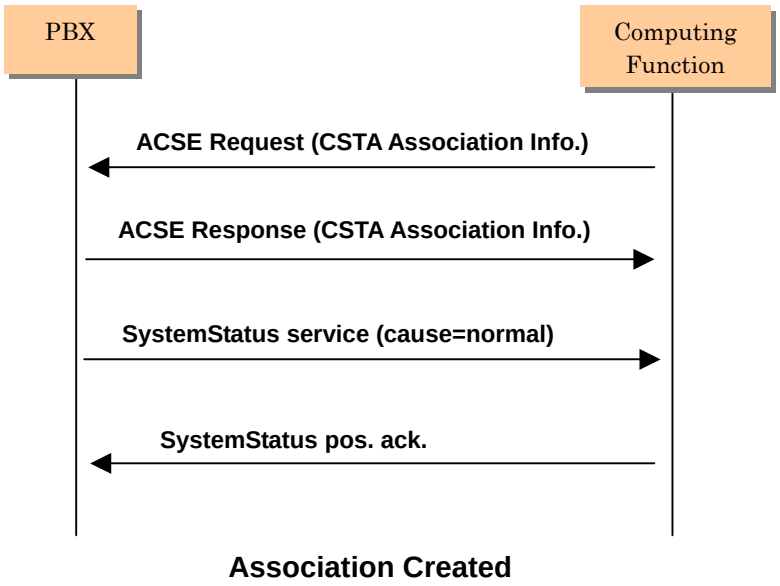
ABRT-apdu

Parameter Name	M/C/O	TDA/TDE	Description
abort-source	M	Yes	
abort-diagnostic	O	No	
user-information	O	No	

4.2. Initialization Sequence

The initialization sequence for an explicit association is shown below. The computing function begins the sequence by sending an ACSE request with the appropriate CSTA Association Information. The switching function responds with an ACSE response that also includes the appropriate CSTA Association Information.

After the ACSE exchange, the switching function sends a System Status service with a system status cause of Normal. The computing function shall respond with a positive acknowledgement. The mandatory part of the initialization sequence is completed once the positive acknowledgement is received by the switching function.



4.3. Association Failure Report

When TDA/TDE PBX detects a CTI related trouble, a PBX error log is recorded and SMDR is generated.

Error Log Message		Priority	Description
Memory Shortage			
	CTI Monitor stopped	Minor	CSTA device monitor has stopped due to memory shortage (Significance level 1).
	PC Console disconnected	Minor	PC Consoles have disconnected due to memory shortage (Significance level 2).
	First Party CTI disconnected	Minor	First party CT Links have disconnected due to memory shortage (Significance level 3).
	CT Link disconnected(No memory)	Minor	Third party CT Link has disconnected due to memory shortage (Significance level 4).
SystemStatus Trouble			
	CT Link no response	Minor	A SystemStatus result is not received.
	CT Link disconnected(No response)	Minor	CT Link has disconnected due to SystemStatus re-try out.
CDR Trouble			
	CDR retry out	Minor	CT Link has disconnected due to CDR Report re-try out.

5. Capability Exchange Service

5.1. Services

5.1.1. Get Switching Function Devices

C -> S

The Get Switching Function Devices service is used by the computing function to obtain the current device list of PBX. The categories of requested device need to be specified.

Request

Parameter Name	Type	M/O/C	TDA/TDE	Description
requestedDeviceID	DeviceID	O	No	
requestedDeviceCategory	ReqDeviceCategory	O	Yes	Be sure to specify the categories of requested devices.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specific private data.
kmeOtherDevice	KmeOtherDevice			(Mandatory if requestedDeviceCategory=other) Specify when requesting VM Group, Doorphone and so on.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
serviceCrossRefID	ServiceCrossRefID	M	Yes	Specifies the correlator used to associate subsequent Switching Function Devices services to this service request.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Note

The PBX issues more than one Switching Function Device service to a computing function after sending the positive acknowledgement.

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	requestIncompatibleWithObject	ACD category is specified
	invalidParameterValue	PrivateData is missing
UnspecifiedError	None	

TDA/TDE implementation

1. Supported device categories are listed below.

requestedDeviceCategory		Description
Station		
Network Interface		
Park		
Group(ACD)		Incoming Group(UCD)
Group(Hunt)		Incoming Group(HUNT)
Group(Other)		Incoming Group(RING)
Routeing Device		Incoming Group(ACD mode)
Voice Unit		
Other (KmeOtherDevice)	Voice Mail Group (vm)	
	Door Phone	
	DISA	
	Paging Group	
	PS Group	
	External Ringer	
	External Sensor	
	External Pager	
	Modem	
	Hdlc	
	System	

2. To set "requestedDeviceCategory" to "Other", "PrivateData" is necessary.

5.1.2. Switching Function Devices

S -> C

The Switching Function Devices service is initiated as a result of the Get Switching Function Devices service. The PBX generates Switching Function Devices as a series of segments.

Request

Parameter Name	Type	M/O/C	TDA/TDE	Description
serviceCrossRefID	ServiceCrossRefID	M	Yes	Specifies the cross reference used to associate the Switching Function Devices service request to the Get Switching Function Devices service request.
segmentID	INTEGER	O	Yes	Mandatory
lastSegment	Boolean	M	Yes	The last message is "TRUE".
deviceList	DeviceList	M	Yes	DeviceID only.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

None

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	-	

TDA/TDE implementation

1. Negative Acknowledgement issued by the computing function is ignored.
2. The deviceList parameter may be provided without any devices in the list by providing empty deviceList.

6. System Services

6.1. services

6.1.1. System Status

S -> C

The System Status service is used by the PBX to report system status to other party.
Also the PBX sends SystemStatus request periodically to check the association.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
sysStatRegisterID	SysStatRegisterID	C	No	
systemStatus	SystemStatus	M	Yes	System status: Initializing — Not Supported Enabled — Not Supported Normal — Normal state Messages Lost — CDR is lost Disabled — Not Supported Partially Disabled — Not Supported Overload Imminent — Not Supported Overload Reached — System is overload Overload Relieved — Not Supported
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	

TDA/TDE implementation

1. The computing function shall return a positive acknowledgement to the PBX. Otherwise PBX retries to send this service request. If the service request still fails, PBX will send A-Abort and disconnet the association. This will be recorded into PBX error log.
2. The KX-TDA/TDE PBX does not accept the Service Request form the computing function. If received, nothing is returned.
3. Negative acknowledgement from the computing function is ignored.
4. If systemStatus=Overload Reached, then CSTA messages are lost and all monitorings are stopped.
5. In case KX-TDA/TDE PBX detects a SystemStatus related problem, a PBX error log is recorded and SMDR is generated as follows.

Error Log Message (Minor)	Description
CT Link no response	A SystemStatus result is not received.
CT Link disconnected(No response)	CT Link has disconnected due to SystemStatus re-try out.

6.1.2. Switching Function Devices Changed

S -> C

The Switching Function Devices Changed service is used to indicate that the number of devices that the PBX implemented has changed. The Get Switching Function Devices service or the Escape service may be used by computing function to obtain the revised information.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
sysStatRegisterID	SysStatRegisterID	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	

TDA/TDE implementation

1. The changes in the state of INS (In Service)/OUS (Out of Service) will be reported by the PBX by way of the Back In Service event and the Out Of Service event.

7. Monitoring Services

7.1. Services

7.1.1. Monitor Start

C -> S

The Monitor Start service enables the PBX to initiate event reports (otherwise known as events) for a device. The PBX allocates a Monitor Cross Reference Identifier that uniquely identifies the monitor, and then positively acknowledges the computer. After that event reports will be sent to the computer, each event contains the Monitor Cross Reference Identifier.
These event reports cease after the PBX terminates the monitor. Service termination can result from a Monitor Stop request. Once the monitor is terminated, the monitor cross reference ID is no longer valid.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
monitorObject	MonitorObject	M	Yes	Specifies the monitor object of a device to be monitored.
requestedMonitorFilter	MonitorFilter	O	Yes	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. If this parameter is not provided (or if the parameter is not supported by the switching function), then it shall mean that no filtering of events is requested (all events are requested).
monitorType	MonitorType	O	No	
requestedMonitorMediaClass	MonitorMediaClass	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
crossRefIdentifer	MonitorCrossRefID	M	Yes	This indicates 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. It shall also allow correlating Monitor Stop and subsequent Change Monitor Filter services with the original Monitor Start service on which they act.
actualMonitorFilter	MonitorFilter	C	Yes	This parameter specifies the actual set of events that will be filtered (not sent) by the PBX. It is a bitmap of all events defined in this standard.
actualMonitorMediaClass	MonitorMediaClass	C	No	
monitorExistingCalls	Boolean	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceID	No such device
SystemResourceAvailabilityErrors	resourceLimitExceeded	Number of monitoring to a device is over.
	ResourceBusy	The system is overload condition
UnspecifiedError	None	

TDA/TDE Implementation

1. There is limitation on requestedMonitorFilter. Refer to 3.7 Monitoring for more detail.
2. MonitorStart request after monitoring has been started is accepted. Monitor filter requested last in the same device category is valid.
3. If requestedMonitorFilter in MonitorStart request is empty (=length is 0), the PBX set unsupported events to actualMonitorFilter as filtered event.

7.1.2. Monitor Stop

C -> S

The Monitor Stop service is used to cancel a previously initiated Monitor Start service. A positive acknowledgement to the service request indicates that the Cross Reference ID used by the Monitor Start service has become invalid.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
crossRefIdentifer	MonitorCrossRefID	M	Yes	This indicates the Cross Reference Identifier provided in the original Monitor Start service positively acknowledges.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	Invalid monitorCrossRefId
UnspecifiedError	None	

TDA/TDE Implementation

1. The PBX will not issue this service.
2. The PBX does not terminate the monitor even though the monitored device becomes OUS. If the associatation between the PBX and the PC will be disconnected, all the monitors set on the association will be terminated.
3. MonitorStop request on a device which monitoring is not active is negatively acknowledged.

8. Snapshot Services

8.1. Services

8.1.1. Snapshot Device

C -> S

The Snapshot Device service provides 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 PBX provides the requested information in one or more messages using the Snapshot DeviceData Service.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
snapshotObject	DeviceID	M	Yes	This indicates the deviceID of the device to be snapshot.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
serviceCrossRefID	ServiceCrossRefID	C	Yes	Specifies the reference used to associate subsequent Snapshot DeviceData services to this service request.
snapshotData	SnapshotDeviceData	C	Yes	Specifies information for each call at a device. Following information is provided: - connectionIdentifier - localCallState
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

TDA/TDE Implementation

1. The Dynamic Feature Availability feature is not supported.
2. This service provides the ConnectionID (DeviceID and CallID) and its status.
3. When this service is requested to an ISDN extension (station) or Voice Unit device, deviceID in SnapshotDeviceData parameter is Switching Function Representation format in the positive acknowledgement.

8.1.2. Snapshot DeviceData

S -> C

The Snapshot DiviceData service is initiated as a result of the Snapshot Device service.
It is used when the PBX 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 PBX may generate a sequence of Snapshot DeviceData services, individually referred to as segments, in response to a single Snapshot Device service request.

Request

Parameter Name	Type	M/C /O	TDA /TD E	Description
serviceCrossRefID	ServiceCrossRefID	M	Yes	Specifies the reference used to associate the Snapshot DeviceData service messages to the Snapshot Device service request.
segmentID	INTEGER	O	Yes	Specifies the segment number of this message. Each successive segment number in the sequence increments the segmentID by one.
lastSegment	Boolean	M	Yes	Specifies if this segment is the last one associated with the serviceCrossRefID. The complete set of possible values is: TRUE – Indicates that this is the last segment FALSE – Indicates that this is not the last segment in the sequence.
snapshotData	SnapshotDeviceData	M	Yes	Specifies information for each call at a device. Following information is provided: - connectionIdentifier - localCallState
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

None

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	-	

TDA/TDE Implementation

1. Negative Acknowledgement issued by the computing function is ignored.

9. Call Control Services & Events

9.1. Services

9.1.1. Alternate Call

C -> S

The Alternate Call service is used to place an active call on hold temporarily and then connect to an alerting or held call at the same device.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
heldCall activeCall	Station	Held Connected	Connected Held
heldCall activeCall	Station	Alerting Connected	Connected Held

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
heldCall	ConnectionID	M	Yes	Specifies the alerting or held connection for the alternating device.
activeCall	ConnectionID	M	Yes	Specifies the active connection for the alternating device.
connectionReservation	Boolean	O	No	
consultOptions	ConsultOptions	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

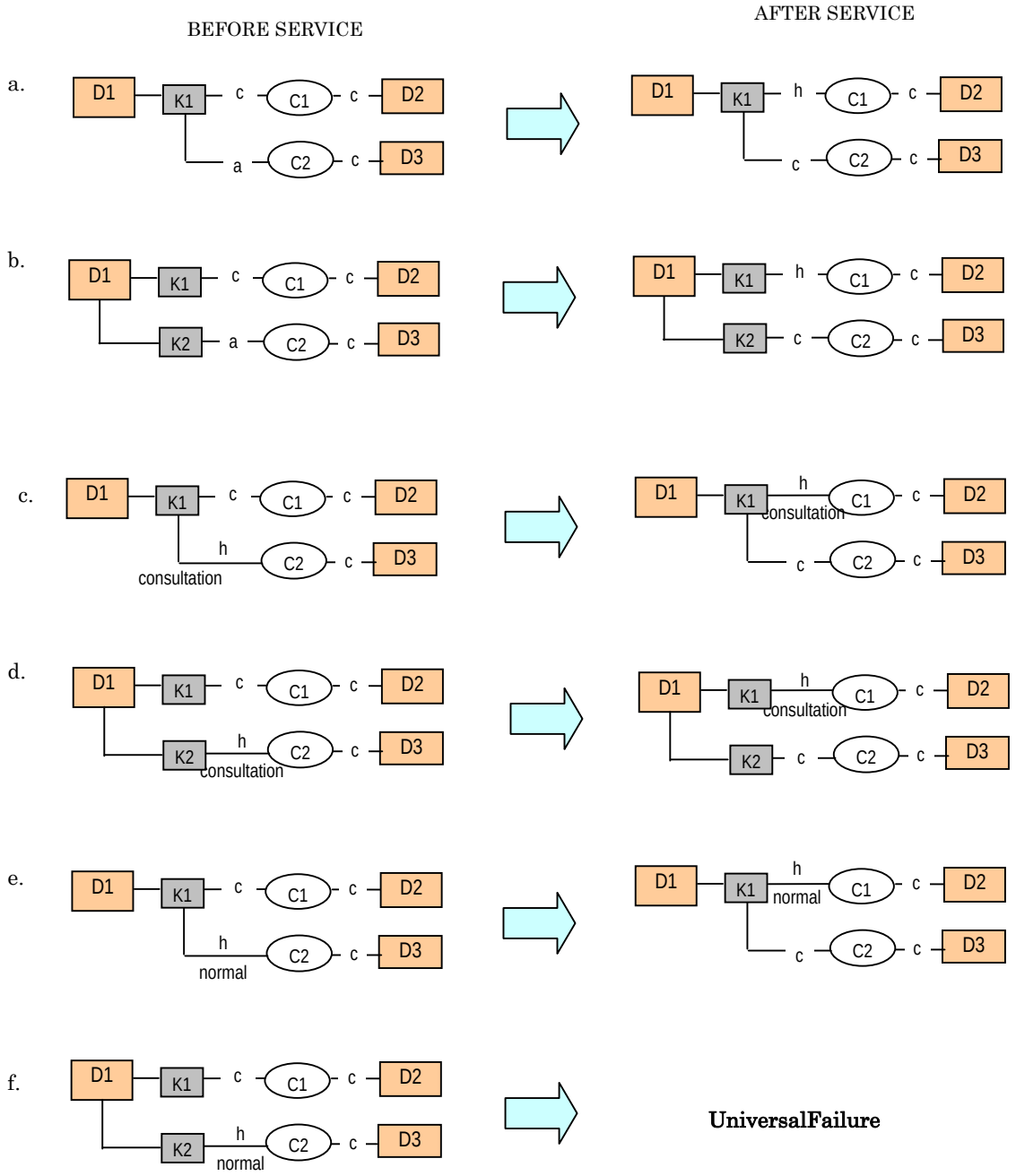
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
	notSameDevice	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. There is limitation on this service. Connection state transition after AlternateCall service depends on combination of calls and physical keys (same key or different key). Typical connection state transitions are

shown below.



9.1.2. Answer Call

C -> S

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 via hands-free operation. For example, when the call is answered, one of the following actions may occur:
- If the specified device has a speaker and a microphone, the speaker and microphone are turned on.
- If the specified device has a headset, the headset is turned on. (It automatically turns on the telephone.)
Also if the specified device is incoming group (ACD mode), the call is answered and the call state turns to queued.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBeAnswered	Station	Alerting	Connected
	Routeing Device	Alerting	Queued

Request

Parameter Name	Type	M/C /O	TDA /TD E	Description
callToBeAnswered	ConnectionID	M	Yes	Connection to be answered.
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

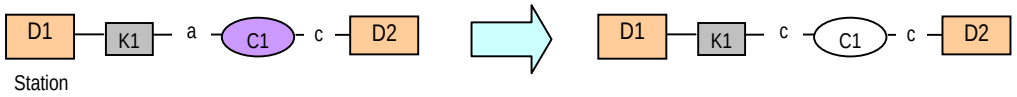
Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

TDA/TDE Implementation

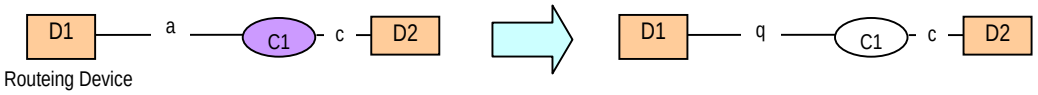
1. To answer an "alerting" call while the connection state of the target device is "initiated" (that is, the target device has the "alerting" and "initiated" connection states), release the "initiated" call with the Clear Connection service, and then invoke the Answer Call service.
2. If the D1 does not have a speaker phone, the PBX negatively acknowledges.
3. Connection state transition after AnswerCall service depends on combination of calls and keys (same key or different key). Typical connection state transitions are shown below.

4. Wake up call can not be answered by AnswerCall request.
5. AnswerCall request to an incoming group(ACD mode=on) is not supported when the originator of the call have a consultation hold call.
6. Typical connection state transitions are as follows.

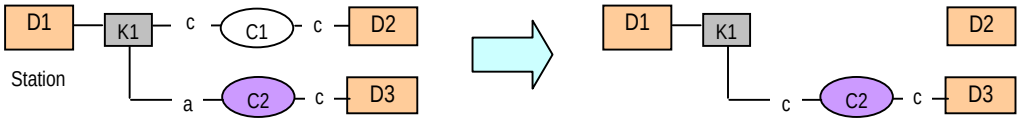
a.



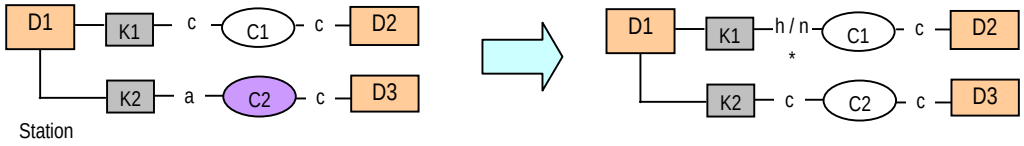
b.



c.



d.



*** Depends on PBX setting, connection will be held or cleared.**

9.1.3. Call Back Call-Related

C -> S

The Call Back Call-Related service allows a computing function to request that the calling device retry the call to the called device by the Private Event (KmeCallBackNotification) and Escape Service (KmeCallBackInvoke) when the called device is busy.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callBackConnection	Station	Failed (BT)	Failed (ROT)
(target device)	Station	(busy)	(busy)
	Network Interface		

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
callbackConnection	ConnectionID	M	Yes	The call back connection at the calling device.
callCharacteristics	CallCharacteristics	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
targetDevice	DeviceID	C	Yes	The deviceID of the device that the call back was initiated for.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceLimitExceeded	Number of Callback is over
UnspecifiedError	None	

TDA/TDE Implementation

1. To enable this service with the KX-TDA/TDE PBX, a called device must be in "busy" state.
2. Only one Call Back Related service request can be outstanding for any calling and called device pair.
3. The target device can retain a maximum of 4 Call Backs (= originating device). The PBX will negatively acknowledge to the further Call Back Call-Related service request.
4. The originating device can set a maximum of 1 Call Back. If the second Call Back is requested while the first set Call Back remains, the PBX cancels the first one, and then set the second one.
5. To cancel a CallBack , the computing function shall issue the Cancel Call Back service, alternatively the Call Back should be manually canceled (feature number).

6. Even if originatingDevice turns to OUS, CallBack feature remains valid. On the other hand, once targetDevice turns to OUS, CallBack feature is discarded without CallBack event.
7. When this service is issued for the purpose of external outgoing call, value of targetDevice in positive acknowledgement will be a network interface device or no value.

9.1.4. Call Back Message Call-Related

C -> S

The Call Back Message Call-Related service is used by a computing function to set the Message Waiting to the called device so that the called device call the calling device. When the Message Waiting is set, the Message Waitng indicator lights.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callBackMessageConnection	Station	Failed (BT, DNDT)	Null new call : Initiated
		Connected	Null new Call : Initiated
(target device)	Station	(busy)	(busy)
		Connected	Null or Failed
		Alerting	Null

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
callbackMessageConnection	ConnectionID	M	Yes	The call back message connection at the calling device.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
targetDevice	DeviceID	C	Yes	The deviceID of the device that the call back message was left for.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	Busy of internal memory
UnspecifiedError	None	

TDA/TDE Implementation

1. To arbitrarily leave a call back message, try the Call Back Message Non-Call-Related service request.
2. Only one Call Back Message service request (Call-Related or Non-Call-Related) can be outstanding for any calling and called device pair.
3. The target device can retain as many call back messages as the system resource is available. The PBX negatively acknowledges to the further Call Back Message Call-Related service request.

4. The originating device can set as many call back messages as the system resource is available. The PBX negatively acknowledges to the further Call Back Message Call-Related service request.
5. To cancel a Call Back Message (Call-Related or Non-Call-Related), the computing function shall issue the Cancel Call Back Message service, alternatively the Call Back Message should be manually canceled.

9.1.5. Clear Connection

C -> S

The Clear Connection service releases a specific device from a call. In the case of 2-party conversation, the remaining connection turns "fail" state.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBeAnswered	Station	Connected Initiated Failed	Null or Failed
	Network Interface	Connected	Null
	Routeing Device	Queued	Null

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
connectionToBeCleared	ConnectionID	M	Yes	The connection to be cleared.
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. If the cleared device has set the Automatic Answer feature, the "failed" connection is automatically and immediately cleared.
2. If the connection to the originator of a conference (which invokes the ConsultationCall) is cleared with this service, all the connections in that conference call will be cleared. Any other members in the conference will be removed respectively.
3. When a device has two connections and one of them is held (consultation) connection, ClearConnection to a connection (other than held state)
4. If a device has two connections and one of them is the held(consultation) state, when the other is disconnected, the type of held is changed to normal and then Recall is generated.
5. When CO-CO call is cleared by this service, order of ConnectionCleared-Events are not correct.

9.1.6. Conference Call

C -> S

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 (that is, the conference call).

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
heldCall	Station	Held (consultation)	Connected
activeCall		Connected	Connected

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
heldCall	ConnectionID	M	Yes	Hold(consultation) state connection
activeCall	ConnectionID	M	Yes	Connected state connection
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
conferenceCall	ConnectionID	M	Yes	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.
connections	ConnectionList	O	No	
conferenceCallInfo	connectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	Conference trunk is busy,
	resourceLimitExceeded	Max. number of member is over.
UnspecifiedError	None	

TDA/TDE Implementation

1. A maximum of 8 parties can be added to a conference except the originator is an ISDN station. When the

originator is ISDN, maximum number of parties are three.
2. While the originator adds another party, the existing parties in the conference are placed in a Consultation Hold. It is necessary to issue the Consultation Call service request to enable the Consultation Hold.
3. The Conference Call service cannot be invoked when the consultedDevice is in "alerting" state.

9.1.7. ConsultationCall

C -> S

The Consultation Call service places an existing active call at a device on hold (Consultation Hold) and initiates a new call from the same device. The existing call may include two or more devices.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
existingCall	Station	Connected	Held(new call:Connected) Held(new call:Failed) Held(new call:Initiated)
consultedDevice	Any diallable digits	Null	Connected Failed
(other device)	Station	Connected	Connected
	Network Interface		

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
existingCall	ConnectionID	M	Yes	Connected state connection
consultedDevice	DeviceID	M	Yes	Specifies the device to be consulted. Max 32 digits.
connectionReservation	Boolean	O	No	
accountCode	AccountInfo	O	No	
authCode	AuthCode	O	No	
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
callCharacteristics	CallCharacteristics	O	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callingConnectionInfo	ConnectionInformation	O	No	
consultOptions	ConsultOptions	C	Yes	(Mandatory) transferOnly or conferenceOnly
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
vmRecExtNo	IA5String(SIZE(1..5))			(Mandatory) If it is a Voice Mail Transfer, be sure to set the Voice Mail extension number.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
initiatedCall	ConnectionID	M	Yes	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.
mediaCallCharacteristics	MediaCallCharacteristics	C	No	
initiatedCallInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	invalidParameterValue	Invalid privateData / consultOptions or Length of consultedDevice is over 32 digits.
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceOutOfservice	Device, Resource is OUS
	resourceLimitExceeded	
UnspecifiedError	None	

TDA/TDE Implementation

1. The PBX supports both "Case A" and "Case B" in ECMA-269 17.1.10 Consultation Call.
2. The service is to place a call on consultation hold in the process of the Transfer Call or Conference Call services.
3. For the consultedDevice, all active features for this device will be honoured while the call is being made to it.

9.1.8. Deflect Call

C -> S

The Deflect Call service allows the computing function to divert a call that may be inside or outside the PBX.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBeDiverted	Station	Alerting Held	Null
	Routeing Device	Alerting Queued	Null
newDestination	Any diallable digits	Null	Alerting Failed
(calling device)	Station	Connected	Connected
	Network Interface		
	Door Phone		

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
callToBeDiverted	ConnectionID	M	Yes	Specifies the connection to be diverted.
newDestination	DeviceID	M	Yes	Specifies the device to which the call is to be diverted.
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
forcedAlerting	KmeForcedAlerting	O		(Optional) This parameter is used to ignore forward/DND setting (fwdDnd) of newDestination and/or timer of intercept / recall feature.
ogmContinuation	BOOLEAN	O		(Optional) This parameter is used to continue OGM after DeflectCall is performed. This parameter is valid only when diverted call is in ACD queue. This feature is available TDA/TDE version 1.006 or later.
ringPattern	INTEGER	O		(Optional) This parameter is used to specify ring pattern which is used after the call is redirected.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	privilegeViolationSpecifiedDevice	Regulation
	requestIncompatibleWithObject	

StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. The service is available in the case of:

		newDistination						
		Station	Network Interface	Group	PS Group	Voice Unit	VM Group	Others
callToBe Diverted	Station -Alerting -Hold	Yes	Yes	Yes	Yes	Yes	Yes	No
	Network Interface	No	No	No	No	No	No	No
	Group -Alerting -Queued	Yes	Yes	Yes	Yes	Yes	Yes	No
	PS Group	No	No	No	No	No	No	No
	Voice Unit	No	No	No	No	No	No	No
	VM Group	No	No	No	No	No	No	No
	Others	No	No	No	No	No	No	No

2. DeflectCall service causes **ServiceCompletionFailure** event in case of failure of call redirection.
3. When a group is not ACD (CTI) mode, DeflectCall request for redirecting a call in the group fails.
4. When a group is not ACD (CTI) mode, DeflectCall request for redirecting a call which is alerting a member fails.
5. Forward setting at an incoming group cannot be ignored by privateData-forcedAlerting.
6. When ringPattern is specified, call destination rings in this ringing pattern.
7. When ringPattern is not specified, call destination rings in default ringing pattern.
8. The following ringPattern can be specified.

ringPattern	PT	PS
pattern0	noRing	Off
pattern1	Single	Internal call
pattern2	Double	External call
pattern3	S-Double	Doorphone call
pattern4	Option1	Recall of external call
pattern5	Option2	Recall of internal call

9. When newDestination is SLT for extentionCallerID and ringPattern is pattern0(silent), CallerID is not displayed.
10. If newDestination is busy, the destination may start ring in certain setting. In this case the ring pattern is default pattern.
11. This service can divert a call in a queue (ACD mode group) even though the call is not at the head of the queue.

9.1.9. Dial Digits

C -> S

The Dial Digits service allows the computing function to perform a dialling sequence that is associated with a call that has already been initiated (i.e., has been initiated via a Make Call or Consultation Call service).

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
diallingConnection	Station	Initiated	Connected Failed Initiated
		failed	Connected Failed

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
diallingConnection	ConnectionID	M	Yes	Specifies the connection which is dialling the digits.
diallingSequence	DeviceID	M	Yes	Specifies the actual string of digits to be dialled. Maximum is 32 digits.
correlatorData	CorrelatorData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidCalledDeviceIdentifier	Invalid digits
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. This service is available either when a trunk is seized manually (e.g., by going off-hook, etc.) or with the call that has been initiated as a result of the holing features.
2. "A-D", "0-9", "#", "*", and ", (comma)" are available to be assigned as the digits of the diallingSequence parameter.
3. This service is available to failed state connection just after initiated state.

9.1.10. Directed Pickup Call

C -> S

The Directed Pickup Call service moves a specified call and connects it at a new specified destination. This results in the connection being diverted to a new device inside the PBX.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBePickedUp	Station	Alerting Held (normal)	Null
	Park	Queued	Null
requestingDevice	Station	Null	Connected

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
callToBePickedUp	ConnectionID	M	Yes	Specifies the connection to be picked up.
requestingDevice	DeviceID	M	Yes	Specifies the device which is picking up the call.
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such callToBePickedUp
	invalidNumberFormat	Requesting device is equal to pickedUpDevice.
	requestIncompatibleWithObject	
	privilegeViolationSpecifiedDevice	Regulation
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS (requestingDevice)
UnspecifiedError	None	

TDA/TDE Implementation

1. This service is used to perform unparking a (queued) call, picking up an alerting call, or retrieving a call which was placed on hold by another extension.

2. The service is used when the device associated with the callToBePickedUp connection ID is different from the newDestination device. If the devices are the same, then a UniversalFailure will be returned.
3. If the requestingDevice does not have a speaker phone, the PBX will negatively acknowledge.
4. This service is not available to retrieve a call queued in an incoming group.
5. Both consultation hold and exclusive hold cannot be picked up.
6. Needed information in callToBePickedUp differs according to feature.

Feature name	callToBePickedUp
Pick up an alerting call	DeviceID only *1
	Both DeviceID and CallID
Unhold	Both DeviceID and CallID
Unpark	DeviceID only *1
	Both DeviceID and CallID

*1：ConnectionID type is "complete Connection ID(CallID and DeviceID)" described in ECMA 269 12.3.9. But length of CallID in ConnectionID is 0.

9.1.11. Hold Call

C -> S

The Hold Call service places a connected connection on hold. This service interrupts communication for an existing call at a device.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBeHeld	Station	Connected	Null
		Hold (normal)	Held (Exclusive)
		Held (Exclusive)	Hold (normal)
		Connected(C1) with Alerting call(C2)	Held(C1) and Connected(C2)
		Connected(C1) with Alerting call(C2)	Held(C1) and Alerting(C2) and Initiated(C3)
		Connected(C1) with Held call(C2)	Held (consultation) (C1) and Connected(C2)
		Connected(C1) with Held cal(C2)	Held(C1) Connected(C2)

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
callToBeHeld	ConnectionID	M	Yes	Specifies the active connection to be held.
connectionReservation	Boolean	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such callToBeHeld.
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. When placing a call on hold, the PBX emits a dial tone. At the time, a new call is "initiated" and the Service Initiated event is issued.
2. If trying to retrieve a call placed on the Exclusive Hold or the Consultation Hold with the Directed Pickup Call service, the PBX negatively acknowledges. (Category: Operational Error, Error Name:

privilegeViolationSpecifiedDevice)

3. The Hold Call service places a call on Normal Hold or Exclusive Hold, but not Consultation Hold; therefore, it is impossible to progress neither of the Transfer Call nor Conference Call services.

4. This service invokes either the Normal Hold or the Exclusive Hold feature depending on the settings of the PBX. It is possible to know which one is applying by the PrivateData of the Held event which is generated as the result of the Hold Call service request.

5. When requesting the Hold Call to the "held" connection, the modes are switched between Normal Hold and Exclusive Hold, and positively acknowledged.

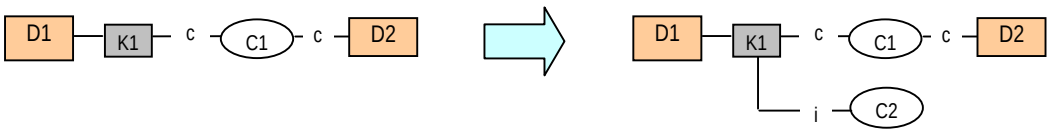
6. There are 2 procedures to retrieve a held call from a computing function:

Retrieve Call : when the holding device and retrieving device is the same.

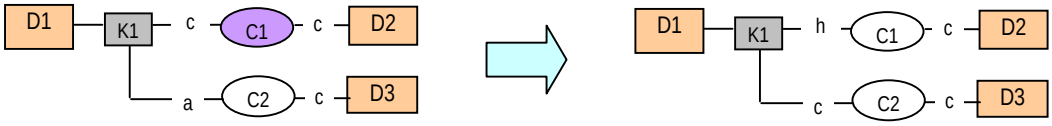
Direct Pickup Call : when the holding device and retrieving device is different.

7. Connection state transition after HoldCall service depends on combination of calls and keys (same key or different key). Typical connection state transitions are shown below.

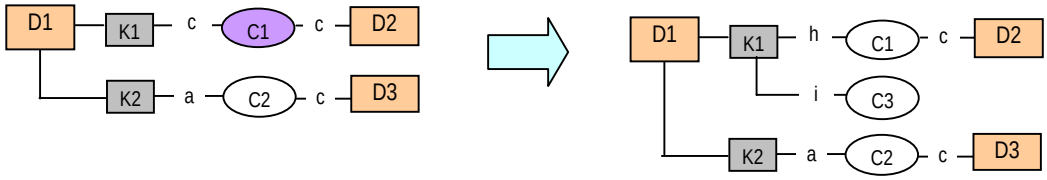
a.



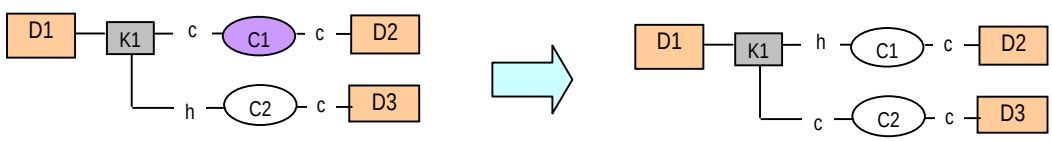
b.



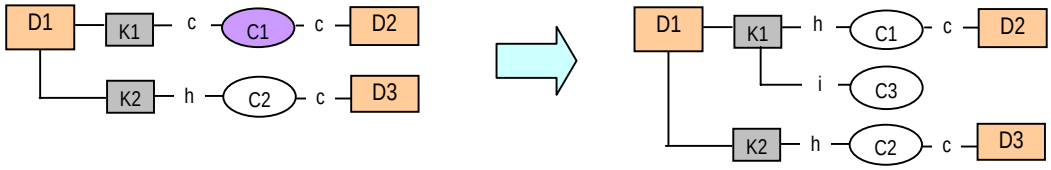
c.



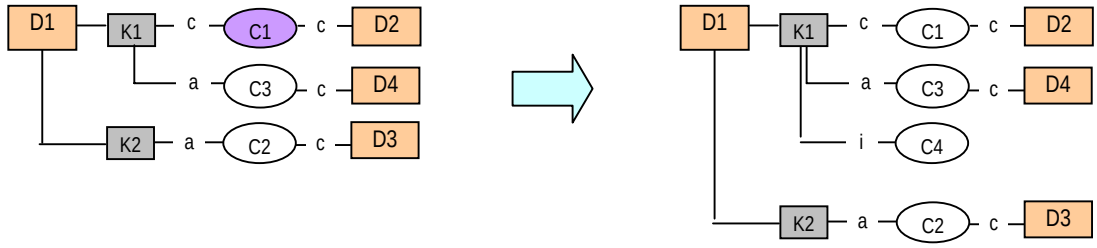
d.



e.



f.



9.1.12. Intrude Call

C -> S

The Intrude Call service adds the calling device to a call at a busy called device. The result will be that the calling device is either actively or silently participating in the called device's existing call.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
intrude	Station	Failed	Connected

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
intrude	ConnectionID	M	Yes	Specifies the connection of the calling device.
participationType	ParticipationType	O	Yes	**active (default)**: The added device actively participates in the resulting conference call. **silent**: The added device can listen but cannot actively participate in the resulting conference call.
userData	UserData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
conferencedCall	ConnectionID	C	Yes	ConnectionID includes the CallID of the resulting call and the DeviceID of the calling device.
conferencedCallInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such intrude connection
	requestIncompatibleWithObject	
	privilegeViolationSpecifiedDevice	Regulation
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	Conference trunk is busy
UnspecifiedError	None	

TDA/TDE Implementation

1. To achieve the Call Monitor feature, set the participationType parameter to "Silent".
2. To achieve the Busy Override feature, set the participationType parameter to "Active".

3. The PBX supports the "Case A" in ECMA-269 17.1.16 Intrude Call, but not "Case B".
4. The initial condition of the service is such as the "Case A" found in the ECMA-269 17.1.16 Intrude Call, and is different from that of the TDA/TDE implementation as described above; therefore, the event sequence in progress of the initial condition is unique.
5. The called device which a calling device will be added with the service should be an extension; it is possible to invoke the service regardless of the types of extensions.
6. It is impossible to add a new party to the resulting conference call.

9.1.13. Make Call

C -> S

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.
In the process of establishing the connection with the calling device which is a single line telephone, the PBX prompts to go off-hook and when that device does so, a call to the called device is originated.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callingDevice	Station	Null	Connected Failed Initiated

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
callingDevice	DeviceID	M	Yes	Specifies the calling/originating device.
calledDirectoryNumber	DeviceID	M	Yes	Max 32 digits. Accepted digits : "1 - 9","A - D", "#","*",",","
accountCode	AccountInfo	O	No	
authCode	AuthCode	O	No	
autoOriginate	AutoOriginate	O	No	
correlatorData	CorrelatorData	O	No	
userData	UserData	O	No	
callCharacteristics	CallCharacteristics	O	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callingConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
callingDevice	ConnectionID	M	Yes	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such callingDevice
	invalidCalledDeviceIdentifier	Invalid digits
	invalidParameterValue	callingDevice is over 32 digits.
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS.
UnspecifiedError	None	

TDA/TDE Implementation

1. While processing the Make Call service, the PBX prompts the calling device with "ringing" if the device is a Single Line Telephone.
2. If the length of calledDirectoryNumber is zero, the PBX initiates a new call and emits dial tone.
3. If the validation of the Make Call service fails for any reason, the computing function is negatively acknowledged, and no valid ConnectionIDs will have been created.
4. The PBX does not support the autoOriginate parameter. It is depending on the types of telephones whether or not the calling device's connection is automatically answered (hands-free mode).
5. All active features are honoured for the called device.
6. If the calling device has the connection "initiated", the PBX negatively acknowledges to that Make Call service request.
7. A group device cannot be set to a calling device.
8. The features available with the Escape service (KmeInteruptCall):
   Busy Station Signalling (BSS)
   Off-Hook Call Announcement (OHCA)
   Whisper OHCA
9. The feature available with the Escape service (KmeDndOverride):
   Do Not Disturb Override (DND Override)

9.1.14. Park Call

C -> S

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

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
parking	Station	Connected	Null (new call : Initiated)
parkTo	Park	Null	Queued

Request

Parameter Name	Type	M/O	TDA/TDE	Description
parking	ConnectionID	M	Yes	Specifies the connection to be parked.
parkTo	DeviceID	M	Yes	Specifies the device to which the call is to be parked (parked-to device). This should be a Park device.
correlatorData	CorrelatorData	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/O	TDA/TDE	Description
parkedTo	ConnectionID	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	No idle park area.
UnspecifiedError	None	

TDA/TDE Implementation

1. As a result of the Park Call service, the call ID associated with this call remains unchanged.
2. There are one hundred park devices in a system. A maximum of one call can be parked to a park device.
3. A park device does not have features such as Do Not Disturb and Forwarding.
4. The PBX recalls the device which executed the call control feature, or which is preprogrammed, if the call is not retrieved within the pre-programmed time period.
5. Event sequences are proprietary. Refer to scenario for more detail.
6. If value of parkTo device is 0x01A100FF, actual parkTo device is selected by the PBX (auto parking feature).

9.1.15. Retrieve Call

C -> S

The Retrieve Call service connects a specified held connection.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
callToBeRetrieved	Station	Held (normal)	Connected
		Held (exclusive)	

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
callToBeRetrieved	ConnectionID	M	Yes	Specifies the held connection to be retrieved.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such callToBeRetrieved
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. If subject does not have a speaker phone (SLT, ISDN station, PS), the PBX negatively acknowledges.
2. This service is available with Normal Hold and Exclusive Hold.

9.1.16. Transfer Call

C -> S

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 shall be merged into a new call. Also, the Connections of the held and active calls at the transferring device shall become Null and their ConnectionIDs shall be released (i.e., the transferring device is no longer involved with the call).

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
heldCall activeCall	Station	Held Connected	Null Null
heldCall activeCall	Station	Held Connected	Null Null

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
heldCall	ConnectionID	M	Yes	Specifies the held(consultation) connection.
activeCall	ConnectionID	M	Yes	Specifies the active connection.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
transferredCall	ConnectionID	M	Yes	Specifies the ConnectionID of the transferredTo device in the resulting call.
connections	ConnectionList	O	No	
transferredCallInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. To get the connections for each of the devices to their initial states, the computing function should use the Consultation Call service to place a call on hold and place a new call.
2. The connection sometimes fails because the transferredTo device is busy when invoking the Consultation Call service. The PBX recalls the transferring device after disconnecting the "failed" connection.
3. To enable the unscreened call transfer, invoke the service while transferredTo device is "alerting". The PBX

recalls the transferring device if the call is not answered in a preprogrammed time of period.

9.2. Events

9.2.1. 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. Common situations that generate this event include is as follows:

- Two-step conferencing situations (manual and service initiated)
- Intrude situations (manual and service initiated)
- Two way Recording (manual and service initiated)
- LCS

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
primaryOldCall	ConnectionID	M	Yes	Specifies the first call visible at the monitored device.
secondaryOldCall	ConnectionID	C	Yes	Specifies the second call visible at the monitored device.
conferencingDevice	SubjectDeviceID	M	Yes	Specifies the device ID of the conferencing device.
addedParty	SubjectDeviceID	M	Yes	Specifies the device ID of the 3rd device added to the call.
conferenceConnections	ConnectionList	M	Yes	Basically uses newConnection, and associatedNID for an external call.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	C	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Active Participation	The call was conferenced due to Busy Override (Intrude Call) feature.
Conference	The call was conferenced because of a two step conference.
Silent Participation	The call was conferenced due to Call Monitor (Intrude Call) feature.
Normal	Others

TDA/TDE Implementation

1. The parameter value of the conferenceConnections which is generated as the result of more-than-4-party conference, includes the information of 2 parties (originator and added party).
2. The values of the primaryOldCall and secodaryOldCall parameters are based on "local view".

9.2.2. Connection Cleared

The Connection Cleared event indicates that a single device has disconnected or dropped out of a call. Common situations that generate this event include:

- A user manually terminates the call (by going on-hook, for example).
- The Clear Connection service is successfully invoked.
- Connection clears as a result of some other service's operation.

Event Parameters

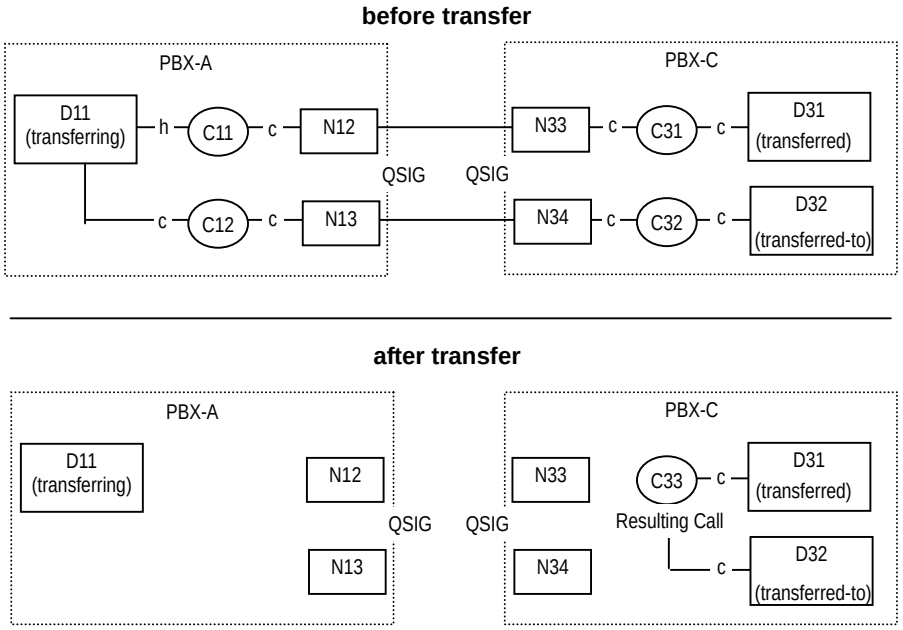
Parameter Name	Type	M/C/O	TDA/TDE	Description
droppedConnection	ConnectionID	M	Yes	Specifies the connection of the device that was dropped from the call.
releasingDevice	SubjectDeviceID	M	Yes	Specifies the device that dropped from the call.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associate with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
chargingInfo	ChargingInfo	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event. Supported causes are : - Call Cancelled - Network Signal - Normal Clearing - Override
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
droppedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	
CallID	OCTET STRING	O	-	(Optional) CallID of transferred call after transfer.

Event Causes

Event Cause	Description
Call Cancelled	The connection was cleared without a device going on-hook (e.g. timeout).
Network Signal	The device located outside the switching sub-domain has dropped from the call.
Normal Clearing	The connection was cleared (a more specific event cause cannot be provided).
Override	The connection was cleared because of an override feature.

TDA/TDE Implementation

1. When QSIG Call Transfer by rerouting is performed, the PBX generates events as if two individual actions are performed (clearing connection and transfer call). A new parameter (callID) is added to this event as a privateData for associating clearing connection with transfer call. This callID in ConnectionCleared event indicates resulting callID of transfer call (Refer to following digram).



9.2.3. 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.

Common situations that generate this event include:

- A call has been assigned to a device and that device is alerting.
- A call has been assigned to group.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
connection	ConnectionID	M	Yes	Specifies the connection that is alerting.
alertingDevice	SubjectDeviceID	M	Yes	Specifies the device that is alerting.
callingDevice	CallingDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Specifies the previously known redirected from device.
originatingNIDConnection	ConnectionID	O	No	
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
connectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
device	DeviceID			(Optional) This parameter specifies original callerID when alertingDevice is consulted device.
broadcastGroupNo	INTEGER			(Optional) This parameter specifies group number of broadcasting.

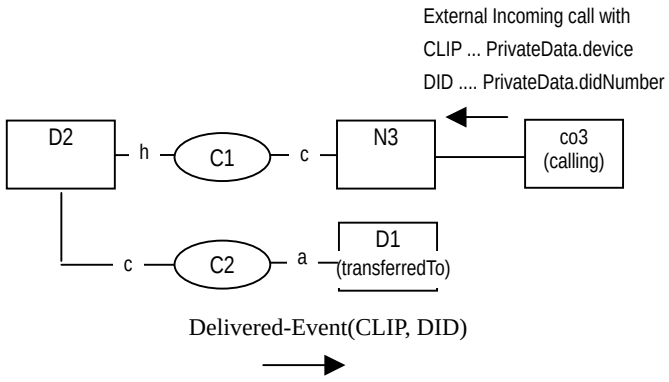
	didNumber		DeviceID			(Optional) This parameter specifies original DID number when alertingDevice is consulted device.

Event Causes

Event Cause	Description
Call Back	The call was delivered to a device because of a previously set call back feature.
Call Forward-Busy	The call was delivered to a device after it was forwarded because of a busy condition.
Call Forward-immediate	The call was delivered to a device after it was forwarded (forwarding on all conditions).
Call Forward-No Answer	The call was delivered to a device after it was forwarded because of a no answer condition.
Distributed	The call was delivered to a device because the call has moved from an incoming group to an available device associated with the group or delivered to a device by Extension Hunting.
Entering Distribution	The call was delivered to an incoming group for the purpose of being distributed.
Network Signal	The call was delivered to a device that is outside of the switching sub-domain.
New Call	The call was not redirected.
Normal	The call was delivered to a device (a more specific cause cannot be provided).
Overflow	The call was delivered to a device after it overflowed a group or Extension Hunting.
Override	The call was delivered to a device as a result of an override (e.g., Intrude Call) feature.
Recall	The call was delivered to a device as part of the recall feature.
Redirected	The call was delivered to a device by DeflectCall or Intercept feature (Busy/NoAnswer/DND).

TDA/TDE Implementation

1. When OHCA / W-OHCA / BSS feature becomes active, Delivered event is issued and the state of connection is alerting (not connected).
2. While paging is performed, paging call is delivered to paging group device (not to each group member device) and the state is alerting. This is applicable to PS paging.
3. Delivered event is not issued for external outgoing call to analog network or E1 line.
4. All of the following conditions are met, Delivered events for an extensnion device are not issued.
   - A call is redirected by call redirection feature(e.g. Forward, Overflow, etc) from an extension device to an incoming group.
   - The extension device is a member of the incoming group.
   - The extension device sets CallWaiting.
5. Data type of DeviceID for networkCallingDevice and networkCalledDevice are OtherPlan(OCTET STRING) type (not NumberDigits type).
6. The value of CallingDevice is modified CallerID by Automatic CallerId Number Modification feature. The value of NetworkCallingDevice is what is received from network.
7. Data type of privateData - Data type of privateData - device is OtherPlan (OCTET STRING) from TDA version 1.1. This was NumberDigits until TDA version 1.006.
8. Following figure shows relation of CLIP/DID form the network and Delivered event which includes CLIP and DID.



9.2.4. 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.

Common situations that generate this event include:

- A call leaves a device that has some type of forwarding feature activated. Examples are Ring No Answer, Recall.
- A call leaves an ACD Group device to be redirected to an extension, another ACD Group device, or to an offsite destination.
- A divert (Deflect, Pick, etc.) is successfully invoked.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
connection	ConnectionID	M	Yes	Specifies the connection that was diverted.
divertingDevice	SubjectDeviceID	M	Yes	Specifies the device from which the call was diverted.
newDestination	SubjectDeviceID	M	Yes	Specifies the device to which the call was diverted.
callingDevice	CallingDeviceID	C	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	C	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Selection: DeviceID, NotKnown, NotRequired.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
connectionInfo	ConnectionInformation	O	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Call Forward-Busy	The call was diverted to a device after it was forwarded because of a busy condition.
Call Forward-immediate	The call was diverted to a device after it was forwarded (forwarding on all conditions).
Call Forward-No Answer	The call was diverted to a device after it was forwarded because of a no answer condition.
Call Pickup	The call was diverted from a device because of the pickup feature.
Distributed	The call was diverted from a device because it was distributed by an incoming group.
Normal	The call was diverted to a device (a more specific cause cannot be provided).
Overflow	The call was diverted to a device after it overflowed a queue, group, or target.
Park	The park feature has been invoked to either park or unpark a call at a device.
Recall	The call was diverted from a device as part of a recall feature
Redirected	The call was diverted from a device because of a deflect or divert feature.

9.2.5. Established

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

Common situations that generate this event include:

- A call has been answered at a device (e.g., a user has manually gone off-hook).
- The Answer Call service has been successfully invoked.
- A call has been picked by another device.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
establishedConnection	ConnectionID	M	Yes	Specifies the connection that was connected.
answeringDevice	SubjectDeviceID	M	Yes	Specifies the device that connected into the call.
callingDevice	CallingDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Selection: DeviceID, NotKnown, NotReqired, NotSpecified.
originatingNIDConnection	ConnectionID	O	No	
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
establishedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
broadcastGroupNo	INTEGER			(Optional) This parameter specifies group number of broadcasting.

Event Causes

Event Cause	Description
Call Back	The call was established at a device because of a previously set call back feature.
Call Forward-Busy	The call was established at a device after it was forwarded because of a busy condition.
Call Forward-immediate	The call was established at a device after it was forwarded (forwarding on all conditions).
Call Forward-No Answer	The call was established at a device after it was forwarded because of a no answer condition.
Call Pickup	The call was established at a device via a pickup feature.
Distributed	The call was established at a device because the call has moved from an incoming group to an available device associated with the group.
Network Signal	The call was established at a device that is outside of the switching sub-domain.
New Call	The call was not redirected.
Normal	The call was established at a device (a more specific cause cannot be provided).
Overflow	The call was established at a device after it overflowed a queue, group, or target.
Override	The call was established at a device as a result of an override (e.g., Intrude Call) feature.
Recall	The call was established at a device as part of the recall feature.
Redirected	The call was established at a device after it was diverted from or deflected to this device.
Timeout	The event was generated for external outgoing calls when the network is analog and Reverse Detection Mode is disabled.

TDA/TDE Implementation

1. Data type of DeviceID for networkCallingDevice and networkCalledDevice are OtherPlan(OCTET STRING) type (not NumberDigits type).

9.2.6. Failed

The Failed event indicates that a call cannot be completed or a connection has entered the Fail state for some reasons. The connection would be in the Fail state basically when the Busy tone or the Re–order tone is emitted.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
failedConnection	ConnectionID	M	Yes	Specifies the connection that failed.
failingDevice	SubjectDeviceID	M	Yes	Specifies the device that failed.
callingDevice	CallingDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Selection: DeviceID, NotKnown, NotReqired, NotSpecified.
originatingNIDConnection	ConnectionID	O	No	
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	
networkCalledDevice	NetworkCalledDeviceID	O	Yes	
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
failedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Blocked	The call failed after a device has disconnected from a call leaving one other device remaining in the call.
Busy	The call failed after it encountered a busy or unavailable device.
Call Cancelled	The connection was cleared without a device going on-hook (e.g. timeout).
Destination Not Obtainable	The call failed because it could not reach the destination.
Destination Out of Order	The call failed because it encountered a destination out of service.
Do Not Disturb	The call failed because it encountered a device that has the do not disturb feature set.
Reorder Tone	The call failed because it encountered a reorder condition.
Incompatible Destination	The call failed because it encountered an incompatible destination.
Invalid Account Code	The call failed because of an invalid account code.
Invalid Number Format	The call failed because the dialled number is incorrect.
Network Signal	The call was established at a device that is outside of the switching sub-domain.
Normal	The call was established at a device (a more specific cause cannot be provided).
Resource Not Available	The call was established at a device as a result of an override (e.g., Intrude Call) feature.
Trunks Busy	The call failed because there is no available Network Interface Device

TDA/TDE Implementation

1. When failing to receive a call because the called device is busy, event flow is proprietary. For more detail, refer to 3.8.2 Connection Failure.
2. Failed event will be issued when telephony tone is changed from busy to re-order.
3. Once a connection state turns to failed, it is impossible to see state of the other connection over the failed connection.

9.2.7. Held

The Held event indicates that a call has been placed on hold. Common situations that generate this event include:

- Consultation situations (manual and service initiated).
- Hold situations (manual and service initiated).

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
heldConnection	ConnectionID	M	Yes	Specifies the connection at which the hold was activated.
holdingDevice	SubjectDeviceID	M	Yes	Specifies the device at which hold was activated.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
heldConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specific private data.
holdType	KmeHoldType			(Mandatory) Specifies the hold type (Consultation/Normal/Exclusive).

Event Causes

Event Cause	Description
Conference	The call was held at a device as a part of a consultation with the intended purpose of establishing a conference.
Normal	The call was held at a device (a more specific cause cannot be provided).
Transfer	The call was held at a device as part of a transfer feature.

TDA/TDE Implementation

1. If a call on hold is not retrieved within a pre-programmed time period, Hold Recall is invoked at the extension which put the call on hold.
2. When type of hold is changed (ex. from consultation to normal), Held event is issued.

9.2.8. 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.

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.

Additionally, the computing function should assume that it cannot directly manipulate the far–end device associated with the Network Interface Device.

This event is never sent for calls made to devices that are within the PBX.

A common situation that generates this event includes:

- An outgoing call has cut–through at a network interface device and further call progress information, such as the Delivered and Established events, may not be available.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
outboundConnection	ConnectionID	M	Yes	Specifies the outbound connection associated with the call that is leaving the switching sub-domain.
networkInterfaceUsed	SubjectDeviceID	M	Yes	Specifies the Network Interface Device that was selected.
callingDevice	CallingDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Selection: DeviceID, NotKnown, NotReqired, NotSpecified.
originatingNIDConnection	ConnectionID	O	No	
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
networkCapability	NetworkCapability	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
outboundConnectionInfo	ConnectionInformation	O	No	
networkCallingDevice	NetworkCallingDeviceID	O	No	
networkCalledDevice	NetworkCalledDeviceID	O	No	
associatedCallingDevice	AssociatedCallingDeviceID	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Call Forward-Busy	The call left the switching sub-domain after it was forwarded because of a busy condition.
Call Forward-immediate	The call left the switching sub-domain after it was forwarded (forwarding on all conditions).
Call Forward-No Answer	The call left the switching sub-domain after it was forwarded because of a no answer condition.
Normal	The call left the switching sub-domain (a more specific cause cannot be provided).
Overflow	The call left the switching sub-domain after it overflowed a queue, group, or target.
Redirected	The call left the switching sub-domain after it was diverted or deflected.

TDA/TDE Implementation

1. This event is available for all external outgoing calls with either an analogue network or a digital network.
2. After a call has cut through the switching sub-domain boundary to another network (Network Reached event generated), all subsequent events reported for the endpoint to which the Network Interface Device is associated shall include a cause parameter with a cause of Network Signal or Timeout.

9.2.9. 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. Common situations that generate this event when the switch has originated a call at the originating device are:

- Due to the execution of the Make Call service.
- Due to the execution of the Consultation Call service.
- After a user has completed manually dialling a number.
- When an external incoming call originates from a Network Interface Device.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
originatedConnection	ConnectionID	M	Yes	Specifies the connection at which the call originated.
callingDevice	SubjectDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
originatingDevice	DeviceID	O	No	
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
originatedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
broadcastGroupNo	INTEGER			(Optional) This parameter specifies group number of broadcasting.

Event Causes

Event Cause	Description
Call Back	A call was originated from a device because a previously set call back feature.
Consultation	A call was originated from a device as part of a consultation call.
New Call	A call was originated.
Normal	A call was originated from a device (a more specific event cause cannot be provided).

TDA/TDE Implementation

1. When a call is external outgoing call, the value of calledDevice parameter may be NotKnown.

9.2.10. Queued

The Queued event indicates that a call has been queued. Common situations that generate this event include:

- A call is queued at an incoming group.
- A call is parked at a park device.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
queuedConnection	ConnectionID	M	Yes	Specifies the queued connection.
queue	SubjectDeviceID	M	Yes	Specifies the queue device.
callingDevice	SubjectDeviceID	M	Yes	Specifies the calling device.
calledDevice	CalledDeviceID	M	Yes	Specifies the originally called device.
lastRedirectionDevice	RedirectionDeviceID	M	Yes	Selection: SpecifiedDeviceID, NotKnown, NotRequired, NotSpecified
numberQueued	INTEGER	O	No	
callsInFront	INTEGER	O	Yes	Specifies the number of calls ahead of the call when it was enqueued (this call is not counted in this number).
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	Yes	Specifies the Network Interface Device associated with the calling device if the call is an external incoming call. This parameter is provided for all external incoming calls.
associatedCalledDevice	AssociatedCalledDeviceID	C	Yes	Specifies the Network Interface Device associated with the called device if the call is an external outgoing call. This parameter is provided for external outgoing calls only.
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
queuedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
No Available Agent	The call was queued to a device because there were no available agents.
Normal	The call was queued to a device (a more specific cause cannot be provided).
Park	The call was queued because of the park feature.

TDA/TDE Implementation

1.When AnswerCall is issued to an alerting call on routeing device, the connection state turns to queued and Queued event is issued.

2. When a call is parked at a device, the parameter value in the callsInFront stays zero.

9.2.11. Retrieved

The Retrieved event indicates that a previously held call has been retrieved. Common situations that generate this event include:

- When a held call is retrieved through the phone using features such as Retrieve, Alternate, etc.
- When a held call is retrieved during the successful execution of the Alternate Call, or the Retrieve Call service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
retrievedConnection	ConnectionID	M	Yes	Specifies the connection at which hold was deactivated.
retrievingDevice	SubjectDeviceID	M	Yes	Specifies the device at which hold was deactivated.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
retrievedConnectionInfo	ConnectionInformation	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Normal	The call was retrieved at a device (a more specific cause cannot be provided).

9.2.12. Service Initiated

The Service Initiated event indicates that a telephony service has been initiated at a monitored device. The PBX typically generates this event when "dial-tone" is being provided. 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.

Common situations that generate this event include:

- A Make Call or Consultation Call service has been invoked and the originating device is initiating a new call that is associated with the originating device.
- When manually invoking any feature at a device for an existing call that requires a new call to be created to input the feature.
- When a device is taken off-hook manually.
- When an incoming call arrives on a monitored Network Interface Device.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
initiatedConnection	ConnectionID	M	Yes	Specifies the connection at which service was initiated.
initiatingDevice	SubjectDeviceID	M	Yes	Specifies the initiating device.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
initiatedConnectionInfo	ConnectionInformation	O	No	
networkCallingDevice	NetworkCallingDeviceID	O	Yes	Specifies the original calling device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
networkCalledDevice	NetworkCalledDeviceID	O	Yes	Specifies the original called device information provided by the network for external incoming calls. This parameter is provided only for external incoming calls.
associatedCallingDevice	AssociatedCallingDeviceID	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
broadcastGroupNo	INTEGER			(Optional) This parameter specifies group number of broadcasting.
featureNumber	INTEGER			(Optional) Value=4 indicates this call is generated with different COS.

Event Causes

Event Cause	Description
Call Back	The telephony service was initiated at a device and the device is being prompted to go off-hook because of a previously set call back feature.
Consultation	The telephony service was initiated at a device as part of a consultation.
Make Call	The telephony service was initiated at a device and the device was being prompted to go off-hook.
New Call	The telephony service was initiated for establishing a connection with another device.
Normal	A more specific event cause cannot be provided.

TDA/TDE Implementation

1. Some CSTA services (Make Call, Call Back) may require to prompt the user of the targeted device in order to take that device off-hook. In this case, a Service Initiated event is generated **after user's off-hook** containing the appropriate cause code (Make Call, Call Back).
2. In some cases the PBX generates a call on an extension line while the extension's COS(Class Of Service) is temporary changed (mostly changed to higher COS for permitting an external call). To indicate such call a parameter (featureNumber) is added to this event as privateData.

9.2.13. Tranferred

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.

A common situation that generates this event is two step transferring situations (manual and service initiated).

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
primaryOldCall	ConnectionID	M	Yes	Specifies the connection of the primary call.
secondaryOldCall	ConnectionID	C	Yes	Specifies the connection of the secondary call.
transferringDevice	SubjectDeviceID	M	Yes	Specifies the device that transferred the call.
transferredToDevice	SubjectDeviceID	M	Yes	Specifies the transferred to device.
transferredConnections	ConnectionList	M	Yes	Only NewConnection is used.
localConnectionInfo	LocalConnectionState	C	Yes	Specifies the local connection state of the device associated with the Monitor Cross Reference ID.
correlatorData	CorrelatorData	O	No	
userData	UserData	C	No	
chargingInfo	ChargingInfo	O	No	
cause	EventCause	M	Yes	Specifies the reason for the event.
servicesPermitted	ServicesPermitted	C	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
callCharacteristics	CallCharacteristics	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Event Causes

Event Cause	Description
Normal	The call was transferred (a more specific event cause cannot be provided).
Transfer	The call was transferred because of a two step transfer.

10. Call Associated Features

10.1. Services

10.1.1. Generate Digits

C -> S

The Generate Digits service causes a series of digits to be sent on behalf of a connection in a call. The digits are sent in the form of DTMF tones.

This service is used for generating end-to-end information that is to be sent to a device in a call (i.e., not to address/select a device).

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

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
connectionToSendDigits	Network Interface Station (Wired only) Voice Unit	Connected	Connected

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
connectionToSendDigits	ConnectionID	M	Yes	Connection of the device which is generating the digits for the call.
digitMode	DigitMode	O	No	DTMF only supported
charactersToSend	IA5String (0..64)	M	Yes	Specifies the strings of characters to send. The maximum length of the value is 64.
toneDuration	INTEGER	O	No	
pulseRate	INTEGER	O	No	
pauseDuration	INTEGER	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

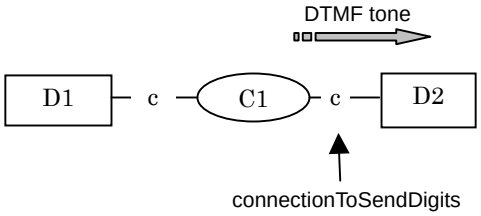
Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	invalidParameterValue	Invalid charactersToSend
	requestIncompatibleWithObject	
	privilegeViolationSpecifiedDevice	Regulation violation
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. This service is used for end-to-end signaling purposes after a call (internal or external) is established.
2. For emitting DTMF tone to a device, receiving side connection shall be specified as connectionToSendDigits parameter.

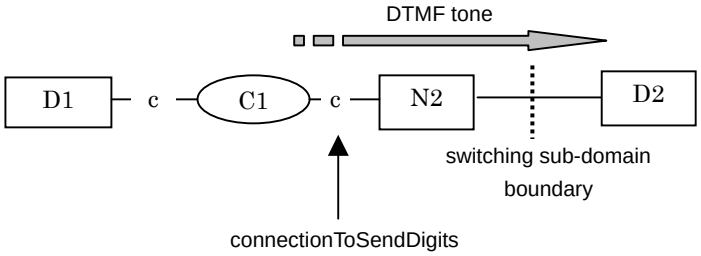
1) Internal Call

For emitting DTMF tone to a device D2 which is an extension line, connection D2C1 shall be specified as connectionToSendDigits parameter. Wired extensions and Voice Mail ports are supported as receiving device (D2). Any type of extensions are supported as emitting device (D1).



2) External Call

For emitting DTMF tone to a device D2 which is outside the PBX, connection N2C1 shall be specified as connectionToSendDigits parameter (N2: Network Interface Device).



3. A digit which includes other characters than 0-9, *, # and A-D is invalid. If the value for the parameter is invalid, the service will be negatively acknowledged.
4. A Generate Digits service request is accepted even if there already is a PBX generated telephony tones (busy, music, ringback, etc.) on the call. Requested DTMF tones interrupt telephony tones.
5. If a Generate Digits service request is received by the PBX while a previous Generate Digits service request has not yet been completed, the new request is queued. Then, the PBX generates the requested DTMF tones in order.
6. When target call is CO-CO talk using digital line of same D-channel, this service is not supported.
7. This service is not available to conference call.

10.1.2. Generate Telephony Tones

C -> S

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.

This service does not affect any of connections.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
connectionToSendTone	Station	Connected	Connected
		Initiated *1	Initiated
	Network Interface	Connected	Connected

*1 ... See TDA/TDE Implementation 1

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
connectionToSendTone	ConnectionID	M	Yes	Connection of the device which is generating the telephony tones for the call
toneToSend	TelephonyTone	M	Yes	Specifies the tone to send. The complete set of possible values is shown in TDA/TDE Implementation.
toneDuration	INTEGER	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

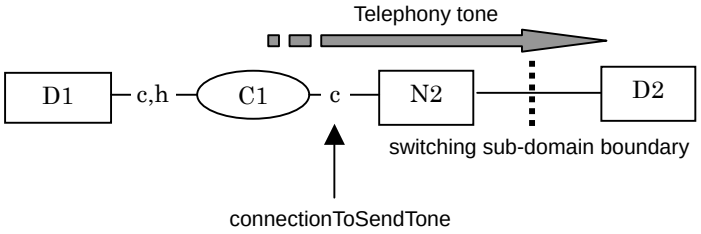
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	invalidParameterValue	Invalid toneToSend
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

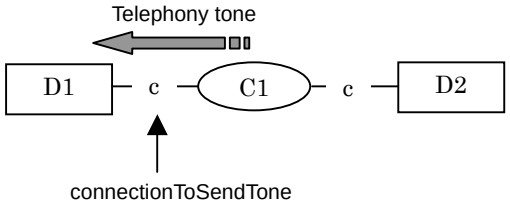
1. This service is used at following conditions.

   a. End-to-end signalling - External Call
      In this case, connection N2C1 is established.



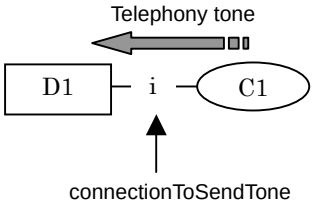
b. End-to-end signalling - Internal Call

In this case, device D1 and device D2 are talking and connection state of D1C1 is connected.



c. Local generating

In this case, device D1 goes off-hook and has an initiated call. GenerateTelephonyTones service is available only after entering feature number for KmeDigitReport.



2. If there already is a PBX generated tone (busy, ringback, etc.) on a call which is to be targeted, the tone will be overwritten.
3. If a Generate Telephony Tones service request is received by the PBX while a Generate Digits service request has not yet been completed, the requested telephony tones will be generated after the DTMF tones.
4. There are two kinds of telephone tones. One is a continuous (cyclic) tone such as a dial tone, and the other is a single tone such as a confirmation tone. When a requested tone is a continuous tone, it continues to be generated until a call is cleared or until the PBX receives another Generate Telephony Tones request whose toneToSend parameter is " SwitchSpecified38 ".
5. External music source and internal music source can be played as well as tones, via the service. External music source is assigned from SwitchSpecified30 and SwitchSpecified31.
6. If the generation of a tone or replaying a background music is interrupted by some reason, neither can be resumed.
7. While a telephony tone is generated on a connection by this service, manual hold operation is rejected. Also HoldCall service request to the connection is negatively acknowledged.
8. Under following condition, GenerateTelephonyTones is negatively acknowledged.
   Conference
   InterruptCall
   IntrudeCall
   2way-recording
   Live Call Screening

9. The following telephony tones can be set to the toneToSend parameter. Mapping of busy, confirmation, dial, intrusion, reorder and ringback depend on region (country).

Tones	Description
busy	Busy Tone 1 (Cyclic tone)
confirmation	Confirmation Tone 1 (Single tone)
dial	Dial Tone 1-A (Cyclic tone)
hold	Hold Tone(Cyclic tone)
intrusion	Call Waiting Tone1 (Cyclic tone)
reorder	Reorder Tone 1 (Cyclic tone)
ringback	Ringback Tone 1 (Cyclic tone)
silence	No sound.
SwitchSpecified0	Confirmation Tone 1 (Single tone)
SwitchSpecified1	Confirmation Tone 2 (Single tone)
SwitchSpecified2	Confirmation Tone 3-1 (Single tone)
SwitchSpecified3	Confirmation Tone 3-2 (Single tone)
SwitchSpecified4	Confirmation Tone 4-1 (Single tone)
SwitchSpecified5	Confirmation Tone 4-2 (Single tone)
SwitchSpecified6	Confirmation Tone 5 (Single tone)
SwitchSpecified7	Dial Tone 1-A (Cyclic tone)
SwitchSpecified8	Dial Tone 1-B (Cyclic tone)
SwitchSpecified9	Dial Tone 2-A (Cyclic tone)
SwitchSpecified10	Dial Tone 2-B (Cyclic tone)
SwitchSpecified11	Dial Tone 3-A (Cyclic tone)
SwitchSpecified12	Dial Tone 3-B (Cyclic tone)
SwitchSpecified13	Dial Tone 4-A (Cyclic tone)
SwitchSpecified14	Dial Tone 4-B (Cyclic tone)
SwitchSpecified15	Busy Tone 1 (Cyclic tone)
SwitchSpecified16	Busy Tone 2 (Cyclic tone)
SwitchSpecified17	Reorder Tone 1 (Cyclic tone)
SwitchSpecified18	Reorder Tone 2 (Cyclic tone)
SwitchSpecified19	Ringback Tone 1 (Cyclic tone)
SwitchSpecified20	Ringback Tone 2 (Cyclic tone)
SwitchSpecified21	Warning Tone (Single tone)
SwitchSpecified22	DND tone (Cyclic tone)
SwitchSpecified23	CO Warning Tone (Cyclic tone)
SwitchSpecified24	Hold Alarm (Cyclic tone)
SwitchSpecified25	Call Waiting Tone1 (Cyclic tone)
SwitchSpecified26	Conference Tone 1 (Normal) (Cyclic tone)
SwitchSpecified27	Conference Tone 1 (Override) (Cyclic tone)
SwitchSpecified28	Hold Tone (Cyclic tone)
SwitchSpecified29	TAFAS Tone (Cyclic tone)
SwitchSpecified30	External Music Source 1
SwitchSpecified31	External Music Source 2
SwitchSpecified32	External Music Source 3 (Not supported in Version 1.0)
SwitchSpecified33	External Music Source 4 (Not supported in Version 1.0)
SwitchSpecified34	External Music Source 5 (Not supported in Version 1.0)
SwitchSpecified35	External Music Source 6 (Not supported in Version 1.0)
SwitchSpecified36	External Music Source 7 (Not supported in Version 1.0)
SwitchSpecified37	External Music Source 8 (Not supported in Version 1.0)
SwitchSpecified38	Cancel tone.

10. When target call is CO-CO talk using digital line of same D-channel, this service is not supported.

10.2. Events

10.2.1. CallInformation

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

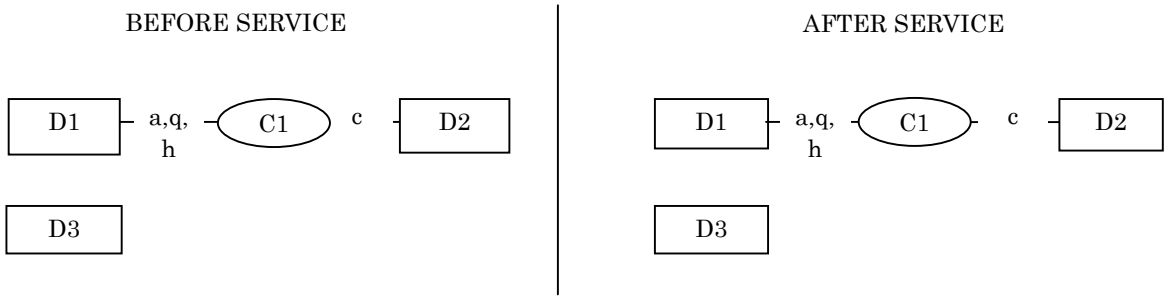
- When the CallerID is informed by the Call Waiting service of the network (Visual CallerID).
- When the CallerID is arrived from the analog network after Delivered event was generated.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
connection	ConnectionID	M	Yes	Indicates the connection of the device responsible for associating the information with the call.
device	SubjectDeviceID	M	Yes	Indicates the device responsible for associating the information with the call.
callingDevice	CallingDeviceID	C	Yes	CallerID
accountInfo	AccountInfo	C	No	
authorisationCode	AuthCode	C	No	
correlatorData	CorrelatorData	O	No	
servicesPermitted	ServicesPermitted	C	No	
userData	UserData	C	No	
callQualifyingData	CallQualifyingData	C	No	
connectionInfo	ConnectionInformation	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	OPTIONAL : Provided only for VisualCallerID
featuerNumber	KmeFeatuerNumber			3: Visual Caller ID

10.2.2. ServiceCompletionFailure

The Service Completion Failure event indicates that a previous multi-step computing function initiated service request has failed before that service's successful completion conditions were satisfied. DeflectCall only may cause this event.



Event Parameters

Parameter Name	Type	M/C /O	TDA /TD E	Description
primaryCall	deviceID	M	Yes	A device involved in the call.
	connectionID	M	Yes	A connection at the device.
	localConnectionState	M	Yes	The local connection state of the connection.
secondaryCall	Structure	O	No	
otherDevicesPrimaryCall List	List of Structures	O	No	
otherDevicesSecondaryC allList	List of Structures	O	No	
mediaCallCharacteristics	MediaCallCharacteristics	O	No	
cause	EventCause	M	Yes	DestinationNotObtainable only
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

11. Physical Device Features

11.1. Services

11.1.1. Button Press

The Button Press service allows a computing function to simulate the activation of a specified button at a specified device.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
button	ButtonID	M	Yes	Specifies the button on the device.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number, and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	ButtonID is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE Implementation

1. In DPT, all of the keys are available.
2. DSS console is not suppotred
3. This service is not available during PT-Programming.

11.1.2. Get Message Waiting Indicator

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

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number, and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
messageWaitingOn	Boolean	M	Yes	Specifies the value of the requested feature. The complete set of possible values is: • FALSE - Message waiting off. • TRUE - Message waiting on.
deviceForMessage	DeviceID	O	Yes	Specifies the device where the message is waiting.
lampIsPresent	Boolean	O	No	Specifies the value of the requested feature, based on the messageWaitingOn parameter. The complete set of possible values is: • FALSE - Lamp is not present. • TRUE - Lamp is present.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
UnspecifiedError	None	

TDA/TDE Implementation

1. If more than one Message Waiting are set, the oldest one is set as deviceForMessage.
2. It is not supported that Message Waiting set by Voice Mail.

11.1.3. Get Microphone Mute

The Get Microphone Mute service provides the microphone mute feature status of a microphone associated with an auditory apparatus at a specified device.
While a device's microphone is muted, no audio information is transmitted over the device microphone. This feature is used when it is desired to prevent the other party(s) in a call from hearing a conversation through the device.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
auditoryApparatus	AuditoryApparatusID	O	Yes	Specifies which auditory apparatus to query. If not provided, then information is obtained on all the auditory apparatuses associated with the device.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number, and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
microphoneMuteList	List of Structures	M	Yes	Specifies information about the specified auditory apparatus or about all auditory apparatuses associated with the device if no auditoryApparatus was provided in the request. Each entry contains the following: - auditoryApparatus (M) AuditoryApparatusID - Specifies the auditory apparatus that the microphone belongs to. - microphoneMuteOn (M) Boolean - Specifies whether the microphone is muted or not. The complete set of possible values is: • FALSE - Microphone is activated. • TRUE - Microphone is muted.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	AuditoryApparatus is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE Implementation

1. Value of auditoryApparatus parameters:

Currently using audio	0x30
Handset / Headset	0x31
Speaker Phone	0x32

11.1.4. Get Speaker Volume

The Get Speaker Volume service provides the speaker volume setting for the speakers associated with one or more auditory apparatuses at a specified device.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
auditoryApparatus	AuditoryApparatusID	O	Yes	Specifies which auditory apparatus to query. If not provided, then information is obtained on all the auditory apparatuses associated with the device.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number, and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
speakerVolumeList	List of Structures	M	Yes	Specifies information about the specified auditory apparatus or about all auditory apparatuses associated with the device if no auditoryApparatus was provided in the request. Each entry contains the following: - auditoryApparatus (M) AuditoryApparatusID - Specifies the auditory apparatus to which this speaker belongs. - speakerVolAbs (O) Value - Specifies the absolute speaker volume. A value of 0 indicates silence, and 100 indicates maximum volume.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	AuditoryApparatus is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

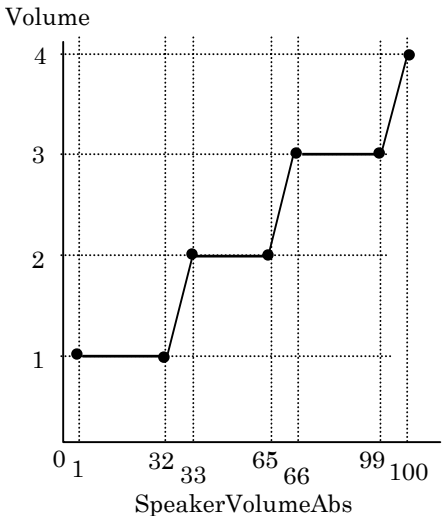
TDA/TDE Implementation

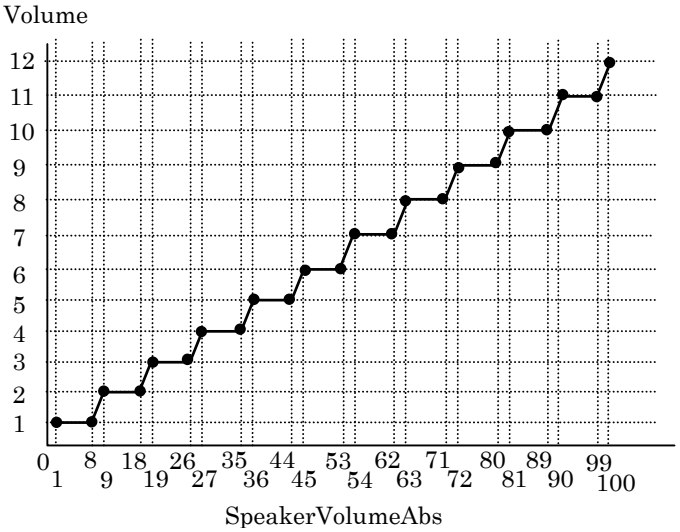
1. Value of auditoryApparatus parameters:

Currently using audio	0x30
Handset / Headset	0x31
Speaker Phone	0x32

2. SpeakerVolumeAbs

Handset / Headset	1, 33, 66, 100
Speaker Phone	1, 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 100





3. Relation of state of device and auditory apparatus is as follows.

auditoryApparatus	State of Device		
	Idle	In use	
	-	Handset/Headset	Speaker Phone
Audio in use	UniversalFailure (invalidObjectState)	Yes	Yes
Handset/Headset	Yes	Yes	Yes
Speaker Phone	Yes	Yes	Yes

11.1.5. SetDisplay

C -> S

The Set Display service allows the computing function to set a display associated with a device. The KmeGetSystemData.deviceData.phoneProperty service can be used to determine the size of a specific display. This service controls LCD display of proprietary telephone from a computing function irrespective of connection status. To control the display, the computing function needs to lock the display by using this service. Once the display is locked, the condition continues as long as the following operation is done.

- "unlock" is specified in privateData of SetDisplay
- Manually cancelled (PAUSE, AUTO DIAL, ACCUNT button)

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device which is controlled by this service.
displayID	DisplayID	C	No	
physicalBaseRowNumber	Value	O	Yes	Specifies row number (zero based) of the first character of requested string.
physicalBaseColumnNumber	Value	O	Yes	Specifies column number (zero based) of the first character of requested string.
contentsOfDisplay	IA5String (0..240)	M	Yes	Specifies the text to place on the display as a string of characters consisting of the text (max., 144 characters [24*6]) on each row of the display (including spaces) concatenated together. If a null string is sent, the display will be cleared. When the text contains any characters other than IA5String, PrivateData (privateContents) must be used. In this case, the length of this string has to be zero.
offset	Value	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
proprietaryContents	OCTET STRING(0..144)			
lockDisplay	BOOELAN			(Optional) true : lock, false : unlock

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

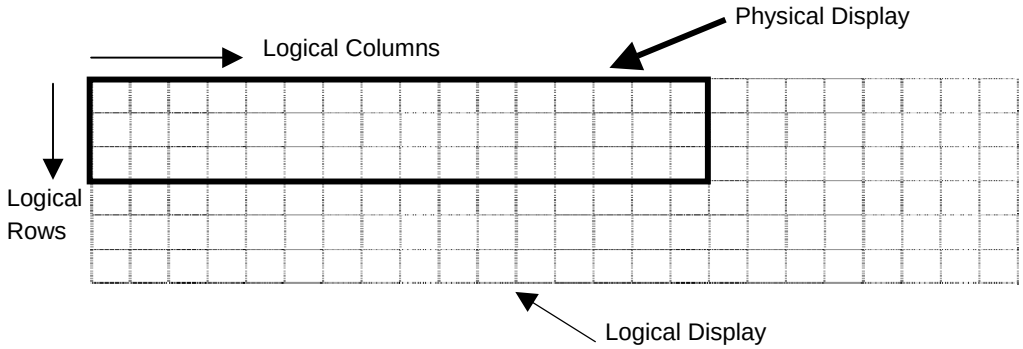
Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE implementation

1. If the characters in the contentsOfDisplay or proprietaryContents parameter overflow the display space, they will be truncated
2. When locking is started, the PBX clears the display regardless of contentsOfDisplay or proprietaryContents. When locking is cancelled, the display is cleared and refreshed.
3. The display area available to the Set Display service is as same as the visible display area. Scrolling is not available.
4. Logical display size is fixed as number of columns is 24 and number of rows is 6. Locaiton of the first character of requested string must be in physical display area. Physical base is always logical row number=0 and logical column number=0, namely left periphery on the first line.



5. If telephone is in programming mode, SetDisplay request becomes UniversalFailure.
6. Once display is unlocked, next SetDisplay request is not accepted for a while and UniversalFailure is returned.
7. Character code table for privateData-proprietaryContents parameter is as follows.

	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
00																
10																
20		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[		]		_
60		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}		
80	€										Š		Œ		Ž	
90																
a0				£												
b0																
c0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
d0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö		Ø	Ù	Ú	Û	Ü			
e0		á			ä					é				í		
f0							ö				ú		ü	ý		

8. In PS, this is available only while the PS is Physical Device Features (PDF) Mode.
9. In PS, the lowest line is not controlled by this service.

11.1.6. Set Lamp Mode

The Set Lamp Mode service allows a computing function to control how a specified lamp is lit at a specified device.

Request

Parameter Name	Type	M/C /O	TDA /TD E	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
lamp	LampID	M	Yes	Specifies the lamp to be set.
lampMode	Value	M	Yes	Specifies how the lamp associated with the specified device should be lit. The complete set of possible values is: - 0 - Brokenflutter. Superposition of wink and flutter - 1 - Flutter. Fast on and off. - 2 - Off. Lamp is off. - 3 - Steady. Lamp is continuously lit. - 4 - Wink. Lamp is winking.
lampBrightness	Enumerated	O	No	Indicates intensity of lamp when the lamp is on (as indicated by lampMode parameter). Actual visible brightness levels are lamp-dependent.
lampColor	Value	O	Yes	Specifies the color of the lamp. The meaning of the following values are pre-assigned: - 1 - Red - 3 - Green
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	lamp, lampMode, lampColor is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE implementation

1. PT and PS can be controlled.
2. In PS, this service is available during CTI Control Mode.
3. This service become available after a FCO key is set as CTI key (Type of Flexible Key = "CTI").
4. LED number is the same as ButtonID(FCO key).
5. Value of LampID should be set as big endian.

11.1.7. Set Microphone Mute

The Set Microphone Mute service allows the computing function to control the microphone mute status of the microphone associated with one auditory apparatus 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.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
auditoryApparatus	auditoryApparatus ID	M	Yes	Specifies the auditory apparatus at the designated device on which to set the feature.
microphoneMuteOn	Boolean	M	Yes	Specifies the microphone mute setting of a particular microphone. The complete set of possible values is: - OFF - Microphone is activated. - ON - Microphone is muted.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	auditoryApparatus is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE Implementation

1. Value of auditoryApparatus parameters:

Currently using audio	0x30
Handset / Headset	0x31
Speaker Phone	0x32

2. This service is available during connected state.
3. Mute is cancelled by changing volume of microphone.

11.1.8. Set Ringer Status

The Set Ringer Status service allows the computing function to control ringing of a specified ringer on a device. It also allows a computing function to control the ring pattern and ring volume settings only during the ringing cycle that is being initiated with this service (i.e. does not permanently change the configuration or programming of the ringer attributes).

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
ringer	RingerID	M	Yes	Specifies the ringer to be set.
ringMode *1	Enamerated	C	Yes	Indicates if the ringer should be rung or not rung. The complete set of possible values is: - ringing - The ringer should be rung. - not ringing - The ringer should not be rung.
ringPattern *1	INTEGER	C	Yes	Indicates the value of the ringing pattern of the ringer. This parameter is only valid when ringMode has a value of ringing. If ringMode has a value of Ringing then ringPattern is Mandatory. Available values are from 1 to 6.
ringVolume *1	Choice of Structure	C	No	Indicates the volume level of the ringer. May specify either an absolute value or may specify that the volume should be incremented or decremented by a switch specified increment. It may be one of the following possible choices: ringVolAbs (Value) - Specifies a value from 0 through 100. 0 indicates silence, and 100 indicates maximum volume. ringVolInc (Enumerated) - Specifies if the volume is to be incremented or decremented by a switch specified amount. The complete set of possible values is: • increment - the volume is incremented • decrement - the volume is decremented. Note that the relationship between the ringer volume and loudness is ringer specific.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

*1 ringMode and ringPattern are mandatory for TDA/TDE PBX.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

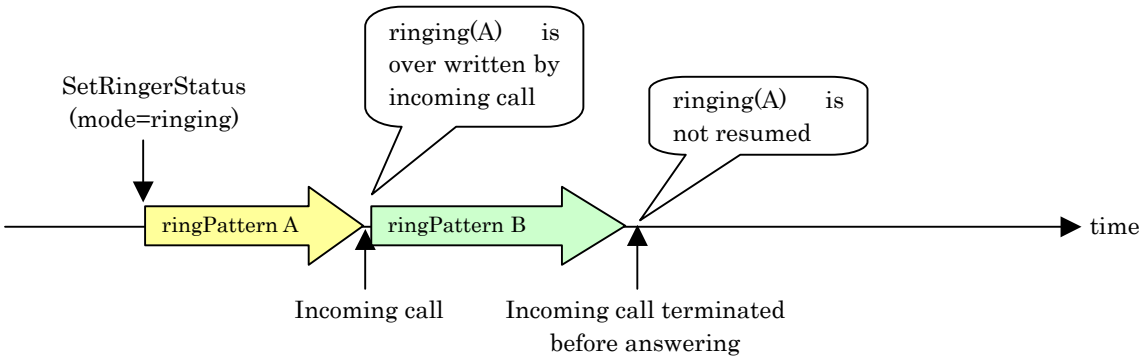
Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	ringer, ringPattern is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE Implementation

1. This service requests PBX to begin ringing immediately when ringMode=0 is specified.
2. Available ringPattern are as follows.

NoRing	0x00
Single	0x01
Double	0x02
Triple	0x03
S-Double	0x04
Option1	0x05
Option2	0x06

3. Ringing started by SetRingerStatus is overwritten by ringing requested by SetRingerStatus or incoming call. If ringing is stopped by incoming call, original ringing is not resumed.(See the figure below.)



11.1.9. Set Speaker Volume

The Set Speaker Volume service allows the computing function to control the speaker volume of the speaker associated with one auditory apparatus at a specified device.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device's physical element.
auditoryApparatus	auditoryApparatusID	M	Yes	Specifies the auditory apparatus containing the speaker whose volume is to be set.
speakerVolume	Choice of Structure	M	Yes	Specifies the speaker volume as an absolute value or that the volume should be incremented or decremented by a switch specified increment. It may be one of the following possible choices: speakerVolAbs (Value) - Specifies a value from 0 through 100. 0 indicates silence, and 100 indicates maximum volume. The granularity and quantization of the values 1 though 99 are device specific speakerVolInc (Enumerated) - Specifies if the volume is to be incremented or decremented by a switch specified amount. The complete set of possible values is: - increment - the volume is incremented - decrement - the volume is decremented.
security	CSTASecurityData	O	No	Specifies timestamp information, message sequence number,and security information.
privateData	CSTAPrivateData	O	No	Specifies non-standardized information.

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	auditoryApparatus, speakerVolAbs is invalid
	serviceNotSupported	SD card for upgrade is not installed
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE Implementation

1. Value of auditoryApparatus

Current used audio	0x30
Handset / Headset	0x31
Speaker Phone	0x32

2. Value of SpeakerVolumeAbs

Handset / Headset	0, 25, 50, 75, 100
Speaker	1, 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 100

3. If speakerVolInc=0 is specified when the volume is maximum, this request is ignored. If speakerVolInc=1 is specified when the volume is minimum, this request is ignored.

4. Relation of state of device and auditory apparatus is as follows.

auditoryApparatus	State of Device		
	Idle	In use	
	-	Handset/Headset	Speaker Phone
Audio in use	UniversalFailure (invalidObjectState)	Yes	Yes
Handset/Headset	Yes	Yes	Yes
Speaker Phone	Yes	Yes	Yes

11.2. Events

11.2.1. Button Press

The Button Press event indicates that a button has been pressed.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	SubjectDeviceID	M	Yes	Specifies the device where the Button Press feature was changed.
button	ButtonID	M	Yes	Specifies the button that was pressed.
buttonLabel	IA5String (SIZE(0..64))	C	Yes	Length of value is zero.
buttonAssociatedNumber	DeviceID	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. This event is generated when a certain button has been pressed manually.
2. Refer to Annex F for button map.
3. In a PS, available keys depend on its mode and state.
4. This event is available for DPT, IP-PT and PS.

11.2.2. Message Waiting

The Message Waiting event indicates that the message waiting status has been changed for a device.
This event may be generated in any one of the following ways:
• The message waiting feature has been changed on the telephone.
• A computing function, on behalf of a user, has invoked the Set Message Waiting service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
targetDevice	SubjectDeviceID	M	Yes	Specifies the device where the message waiting feature has changed.
deviceForMessage	DeviceID	O	Yes	Specifies the originator device which set the message.
messageWaitingon	Boolean	M	Yes	Specifies the setting of the message waiting feature. The complete set of possible values is: • FALSE - Message waiting off. • TRUE - Message waiting on.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

11.2.3. Microphone Mute

The Microphone Mute event indicates that the microphone mute status for a microphone associated with an auditory apparatus at a specified device has changed.
This event may be generated in any one of the following ways:
• The microphone mute feature has been invoked manually on the telephone.
• A computing function, on behalf of a user, has invoked the Set Microphone Mute service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
invokingDevice	SubjectDeviceID	M	Yes	Specifies the device where the feature was invoked.
auditoryApparatus	AuditoryApparatusID	M	Yes	Specifies the auditory apparatus where the mute status was changed.
microphoneMuteOn	Boolean	M	Yes	Specifies whether the microphone is muted or not. The complete set of possible values is: • FALSE - Microphone is activated. • TRUE - Microphone is muted.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. Value of auditoryApparatus
   Handset / Headset 0x31
   Speaker Phone 0x32

11.2.4. Speaker Volume

The Speaker Volume event indicates that the speaker volume setting of a speaker associated with an auditory apparatus at a specified device has changed.
This event may be generated in any one of the following ways:
• The speaker volume feature has been invoked manually on the telephone.
• The computing function has invoked the Set Speaker Volume service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
invokingDevice	SubjectDeviceID	M	Yes	Specifies the device where the feature was invoked.
auditoryApparatus	AuditoryApparatusID	M	Yes	Specifies the auditory device containing the speaker whose volume has changed.
speakerVolume	Volume	M	Yes	Specifies the speaker volume as an absolute value or that the volume was incremented or decremented by a switch specified increment. It may be one of the following possible choices: speakerVolAbs (Value) - Specifies a value from 0 through 100. 0 indicates silence, and 100 indicates maximum volume. The granularity and quantization of the values 1 though 99 are device specific speakerVolInc (Enumerated) - Specifies if the volume was incremented or decremented by a switch specified amount. The complete set of possible values is: • increment - the volume was incremented • decrement - the volume was decremented.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. Value of auditoryApparatus
   Current used audio 0x30
   Handset / Headset 0x31
   Speaker Phone 0x32

2. Value of SpeakerVolumeAbs
   Handset / Headset 0, 25, 50, 75, 100
   Speaker 0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 100

11.2.5. Ringer Status

This event indicates that a ringer status associated with a device has changed.
This event is generated when the switching function has changed the ringer status.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	SubjectDeviceID	M	Yes	Specifies the device where the ring status was changed.
ringer	RingerID	M	Yes	Fixed value(0x31)
ringMode	ENUMERATED	C	Yes	ringing/notRinging
ringCount	INTEGER(0..1000)	C	No	
ringPattern	INTEGER	C	No	
ringVolume	Volume	C	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	
callID	CallID	M		Specifies a CallID which causing ringing.

TDA/TDE Implementation

1. This event is issued when :
   - The first incoming call is delivered.
   - Priority of incoming calls is changed (e.g. Recall during having an alarting call).
     Note : In this case RingStatus event whose ringMode= notRinging is not issued.
   - Call termination under having a incoming call with call waiting feature.
   - Ringing is started by delayed ringing (Incoming Group).

2. This event is not issued when :
   - No sound incoming call
   - Incoming call by Timed Reminder feature

3. This event is issued for PT extension and SLT extension.

12. Logical Device Features

12.1. Services

12.1.1. CallBack Message Non-Call-Related

C -> S

The Call Back Message Non-Call-Related allows a computing function to light Message Waiting Lamp on a targeted device (telephone).
A user originates the Call Back feature by pressing the Message Waiting button.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
originatingDevice	DeviceID	M	Yes	Specifies the originating device for the call back message.
targetDevice	DeviceID	M	Yes	Specifies the target device for the call back message.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	
UnspecifiedError	None	

TDA/TDE Implementation

1. Only one call back message (Call-Related or Non-Call-Related) can be outstanding for any originating device and target device pair.
2. An originating device can retain as many call back messages as the system resource is available.
3. The target device can retain as many call back messages as the system resource is available. Each originating device must be unique.
4. To cancel a Call Back Message, invoke the Cancel Call Back Message service, or follow a manual procedures.
5. This service is unaffected by any conditions of a target device.
6. Even though originatingDevice or targetDevice is OUS, it is possible to set Call Back Message feature.

12.1.2. Cancel Call Back

C -> S

The Cancel Call Back cancels a previous Call Back feature at a device.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
originatingDevice	DeviceID	M	Yes	Specifies the DeviceID of the device who initiated the original Call Back service.
targetDevice	DeviceID	M	Yes	Specifies the DeviceID of the target of the original Call Back service.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	No active Call Back feature
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

TDA/TDE Implementation

1. When a null DeviceID (a DeviceID with 0 characters) is provided, a previous Call Back feature for external device is cancelled.
2. The Cancel Call Back service will be negatively acknowledged when the Call Back feature is not activated at a device

12.1.3. Cancel Call Back Message

C -> S

The Cancel Call Back Message cancels a previous Call Back Message feature at a device.
Note that this service cancels Call Back messages that were created with either Call-Related or Non-Call Related-Call Back Message features.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
originatingDevice	DeviceID	M	Yes	Specifies the DeviceID of the party who initiated the original Call Back Message service.
targetDevice	DeviceID	M	Yes	Specifies the DeviceID of the target of the original Call Back Message service.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	No active Call Back Message feature
UnspecifiedError	None	

TDA/TDE Implementation

1. The Cancel Call Back Message service will be negatively acknowledged when the Call Back Message feature is not activated at a device.
2. When a null DeviceID (a DeviceID with 0 characters) is provided, the PBX returns a negative acknowledgement..
3. While originatingDevice is OUS state, Call Back Message request returns a UniversalFailure.

12.1.4. Get Agent State

C -> S

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

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
device	DeviceID	M	Yes	Specifies the DeviceID of the device on which the agent state is being queried.
acdGroup	DeviceID	O	Yes	This parameter is mandatory.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
agentStateList	AgentStateList	M	Yes	This parameter should be present and it always contains one entry only.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
	invalidAgentGroup	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device(agent) is OUS
UnspecifiedError	None	

12.1.5. Get Auto Answer

C -> S

The Get Auto Answer service provides the auto-answer feature status at a specified device.
The auto-answer feature is used to automatically connect to (answer) a call when it arrives at a device, without manual intervention (hands-free mode).

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the DeviceID of the device on which the auto-answer status is being queried.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
autoAnswerOn	Boolean	M	Yes	Specifies the value of the requested feature. The complete set of possible values is: - FALSE - auto answer is not enabled at the device - TRUE - auto answer is enabled at the device
numberOfRings	INTEGER	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

12.1.6. Get Auto Work Mode

C -> S

The Get Auto Work Mode service provides the auto-work mode feature status at a specified device. The auto-work feature is used to automatically transition an agent state to the WorkingAfterCall state (from the Busy state) after an agent is finished with a call. The feature may also automatically transition the agent state from WorkingAfterCall (to Ready, for example) after a certain amount of time.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the DeviceID of the device on which the auto-work mode status is being queried.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specific private data. (Mandatory) Specifies DeviceID of a group to which the specified device belongs.
device	DeviceID			

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
autoWorkOn	Boolean	M	Yes	Specifies the value of the requested feature. The complete set of possible values is: - FALSE – Auto-work mode off. - TRUE – Auto-work mode on.
autoWorkInterval	INTEGER	O	Yes	Indicates the number of seconds that the agent state remains in the AfterCallWork state.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
	invalidAgentGroup	
UnspecifiedError	None	

TDA/TDE Implementation

1. When a device belongs to several incoming groups at the same time, autoWorkInterval (auto work timer) can be set respectively. It is required to specify the DeviceID of each incoming group to the privateData.

12.1.7. GetForwarding

C -> S

The Get Forwarding service provides the forwarding feature status at 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.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device on which to query.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
forwardList	ForwardList	M	Yes	The list contains one structure per forwardingType/forwardDN combination. The structure has the following components: - forwardingType (C) The PBX always provides this paramter. - forwardStatus (M) Boolean. Indicates the status of the forwarding type. The complete set of possible values is: - FALSE – the forwarding type is deactivated. - TRUE – the forwarding type is active. - forwardDN (C) DeviceID. Specifies the destination to which calls are forwarded. The PBX always provides this paramter. - forwardDefault (O) The PBX does not support this paramter. - ringCount (O) The PBX does not support this paramter.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
UnspecifiedError	None	

TDA/TDE Implementation

1. This service can be used to a device whose state is OUS.

2. Available forwarding types returned in forwardList parameter are listed below.
   forwardBusyInt
   forwardBusyExt
   forwardNoAnsInt
   forwardNoAnsExt
   forwardImmInt
   forwardImmExt
   forwardDNDInt
   forwardDNDExt

3. When one of TDA/TDE specific private forwarding types (forwardBusyNoAnswerInt or forwardingBusyNoAnswerExt) is provided, the each individual forwarding type is grouped into the multiple standardised forwarding types in the forwardList as the table below.

Forwarding Type	Standardised forwarding types in forwarding List
BusyNoAnswerInt	forwardBusyInt and forwardNoAnswerInt
BusyNoAnswerExt	forwardBusyExt and forwardNoAnswerExt

12.1.8. Set Agent State

C -> S

The Set Agent State service requests a new agent state at a specified device.
In the case where an ACD agent is involved with an ACD call, the transition to the requested state may or may not occur until the current connection transitions to the null state.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the DeviceID for the ACD agent for which the state is to be changed.
requestedAgentState	ReqAgentState	M	Yes	Specifies the requested agent state. The complete set of possible values is: - loggedOn – Requests that the agent be logged on. - loggedOff – Requests that the agent be logged off. - notReady – Requests that the agent be placed into the notReady agent state. - ready – Requests that the agent be placed into the ready state.
agentID	AgentID	C	No	
password	AgentPassword	O	No	
group	DeviceID	C	Yes	This parameter is mandatory for this event only when requestedAgentState= LoggedOn/LoggedOff, otherwise this is optional. Note that this group must be the incoming group to which the specified device belongs.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
pendingAgentState	PendingAgentState	C	Yes	Indicates the agent state that the agent will transition to after the agent state is no longer Busy or Working After Call. The complete set of possible value is: - Not Ready - Ready This parameter is provided only if the PBX is delaying the transition to the pendingAgentState until the agent is no longer Busy or Working After Call.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
	invalidAgentState	
	invalidAgentGroup	
	invalidParameterValue	
StateIncompatibilityErrors	invalidObjectState	SXDP feature is set to PS
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

TDA/TDE Implementation

1. Only when the requestedAgentState is LoggedOn or LoggedOff, the group parameter is mandatory. Otherwise, the PBX ignores the group parameter.
2. If this service is issued while the agent state is Busy or WorkingAfterCall, the transition to the requestedAgentState is dalayed until the agent state is no longer Busy or WorkingAfterCall. This is informed by the pendingAgentState in the positive acknowledgement.
3. It is possible that the requested agent state is pending, only when the requestedAgentState paramter is Ready or NotReady.
4. When the PBX receives a Set Agent State service request while the agent state is Busy or WorkingAfterCall and besides there is a pendingAgentState, an existing penndingAgentState will be overwritten.
5. When the PBX receives a Set Agent State service request while the agent state is Busy and auto work mode is true, the agent state changes to requestedAgentState after the auto work timer expires.

12.1.9. Set Auto Answer

C -> S

The Set Auto Answer service allows the computing function to control the auto-answer feature at a specified device. The auto-answer feature is used to automatically connect to (answer) a call when it arrives at a device, without manual intervention (handsfree operation).

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
device	DeviceID	M	Yes	Specifies the device on which to set the feature.
autoAnswerOn	Boolean	M	Yes	Specifies the requested value of the auto answer feature. The complete set of possible values is: - FALSE - Auto-answer off. - TRUE - Auto-answer on.
numberOfRings	INTEGER	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
SystemResourceAvailabilityErrors	deviceOutOfservice	Device is OUS
UnspecifiedError	None	

TDA/TDE Implementation

1. The computing function cannot control the number of rings before a call is answered. If the auto-answer feature is used, the call will be answered imediately when it arrives.
2. Auto-answer is a mode that exists until it is changed. The auto-answer mode may be changed by the Set Auto Answer service or by a manual operation of the buttons on the telephone.

12.1.10. Set Auto Work Mode

C -> S

The Set Auto Work Mode service allows the computing function to control the auto-work feature at a specified device. The auto-work feature is used to automatically transition an agent state to the WorkingAfterCall state (from the Busy state) after an agent has finished with a call.
The feature may also automatically transition the agent state from WorkingAfterCall (to Ready, for example) after a certain amount of time.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the DeviceID for the ACD agent for which the auto work mode is to be changed.
autoWorkOn	Boolean	M	Yes	Specifies the requested value of the autowork feature. The complete set of possible values is: - FALSE – Auto-work off. - TRUE – Auto-work on.
autoWorkInterval	INTEGER (0..6000)	O	Yes	Indicates the number of seconds that the agent state remains in the WorkingAfterCall state. **Valid range is from zero to 3000.** **This value should be multiples of 10, otherwise first digit will be truncated.**
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specifice private data. (Mandatory) Specifies DeviceID of a group to which the specified device belongs.
device	DeviceID			

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
	invalidAgentGroup	
	invalidParameterValue	
UnspecifiedError	None	

TDA/TDE Implementation

1. If the Auto Work Mode is disabled while the agent state already is WorkingAfterCall, the agent state transitions to Ready state after the auto work timer expires. Then, the Auto Work Mode will be disabled after a new call arrives.

2. The setting of the value of the auto-work mode feature as a result of this service is persistent. It remains until it is changed manually or by the Set Agent State service.

12.1.11. Set Caller ID Status

C -> S

This Set Caller ID Status service sets the Caller ID Status at the specified device.
When the status is set to TRUE, the device's Caller ID will be provided on all calls originating from it. When the status is set to FALSE, the PBX will not provide the device's Caller ID on calls, which originated from it, to the called device.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
device	DeviceID	M	Yes	Specifies the device on which to query.
callerIDProvided	Boolean	M	Yes	Specifies whether this device's caller ID value is being provided on outbound calls. The complete set of possible values is: - FALSE - Caller ID is not to be provided on calls originating from this device. - TRUE - Caller ID is to be provided on calls originating from this device.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
UnspecifiedError	None	

TDA/TDE Implementation

1. Value of CallerID depends on PBX setting.

12.1.12. SetForwarding

C -> S

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.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	DeviceID	M	Yes	Specifies the device on which to set the feature.
forwardingType	ForwardingType	C	Yes	Setting for this feature is overwritten. Supported forward type : Refer to 3.8.1
activateForward	Boolean	M	Yes	
forwardDN	DeviceID	C	Yes	
ringCount	INTEGER (1...100)	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specific private data.
kmeFWDType	KmeFWDType	-	Yes	(Optional) BusyNoAnswerInt BusyNoAnswerExt

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidParameterValue	
	requestIncompatibleWithObject	
UnspecifiedError	None	

TDA/TDE Implementation

1. The PBX can specify the following types of forwarding by using the privateData, as well as CSTA standard types of forwarding.

Proprietary forwarding type	Description
forwardBusyNoAnswerInt	Redirects an internal call.
forwardBusyNoAnswerExt	Redirects an external call.

3. SetForwarding request to a group device is invalid.
4. When the status of the activeForward parameter is set to FALSE, the Get Forwarding service cannot

provide the information.

5. Available characters used in forwardDN are 0,1,2,3,4,5,6,7,8,9,A,B,C,D,#,*,",".

6. Even if a device state is OUS, it is possible to set forwarding.

7. Effect of this service is shown below.

forwardingType	activateForward	forwardDN		Effect
Forward	True	Exist	!=0	FWD-On & DN update
			=0	UniversalFailure - InvalidParameterValue
		No	-	UniversalFailure - InvalidParameterValue
	False	Exist	!=0	UniversalFailure - InvalidParameterValue
			=0	Initialize
		No	-	FWD/DND-Off *1
DoNotDisturb	True	Exist	!=0/=0	UniversalFailure - InvalidParameterValue
		No	-	DND-On
	False	Exist	!=0/=0	UniversalFailure - InvalidParameterValue
		No	-	FWD/DND-Off *1

*1 In case of activateForward=False, if requested forwardingType is for internal calls, then forward setting for internal calls is deactivated. If requested forwardingType is for external calls, then forward setting for external calls is deactivated.

8. When forwardBusyNoAnswerInt or forwardBusyNoAnswerExt is set to privateData, acceptable forwardingTypes are limited. Following combinations are accepted.

forwardingType	privateData
forwardBusyInt	forwardBusyNoAnswerInt
forwardNoAnswerInt	
forwardBusyExt	forwardBusyNoAnswerExt
forwardNoAnswerExt	

12.2. Events

12.2.1. 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 ACD call at a device, even if that call is on hold at the device.
An example of when this event is generated is when an agent is connected to an ACD call.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device at which the agent entered the Agent Busy state.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	No	
pendingAgentState	PendingAgentState	C	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

12.2.2. Agent Logged Off

The Agent Logged Off event indicates that an agent has logged off an incoming group. This event is generated when:
- An agent logs off using the telephone.
- An agent is logged off via the Set Agent State service.
- A supervisor logs off an agent on behalf of the agent.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device where the agent logged off.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	Yes	Indicates the ACD group from which the agent logged off.
agentPassword	AgentPassword	O	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. If an agent does not answer a call for a specific period of time, the agent automatically logs off an incoming group in the case that Automatic LoggedOff is set.

12.2.3. Agent Logged On

The Agent Logged On event indicates that an agent is logged on at a particular device to an incoming group and is ready to contribute to the activities of the group.
It does not indicate that the agent is ready to accept ACD calls.
This event is generated when:
- The agent logged on using the telephone.
- The agent logged on using the Set Agent State service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device where the agent logged on.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	Yes	Indicates the ACD group to which the agent logged on.
agentPassword	AgentPassword	O	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. If an agent is logged on to an ACD group in the case that agentDevice does not have any connection, the initial agent state is Ready.

12.2.4. Agent Not Ready

The Agent Not Ready event indicates that an agent has entered the Agent Not Ready state.
In this state an agent is logged-on at a particular device to an ACD group but is not prepared to handle calls that the ACD distributes. While in this state an agent may receive calls that are not ACD calls.
Typical examples of when this event may be generated are:
- An agent logs on using the telephone and is placed into the Not Ready agent state.
- An agent invokes the Agent Not Ready feature on the telephone.
- The agent invoked Agent Not Ready by using the Set Agent State service.
- A supervisor invokes the Agent Not Ready feature on behalf of the agent.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device at which the agent entered the Agent Not Ready state.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

12.2.5. Agent Ready

The Agent Ready event indicates that an agent has entered the Ready state.
In this state, an agent is logged-on at a particular device to an ACD group and is prepared to handle ACD calls even though it may be involved with non-ACD calls.
Typical examples of when this event may be generated are:
- An agent auto-work timer expires. (This is a configuration option.)
- An agent invokes the Agent Ready feature on the telephone.
- The agent invoked Agent Ready by using the Set Agent State service.
- A supervisor invokes the Agent Ready feature on behalf of the agent.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device at which the agent entered the Agent Ready state.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. This event may not issued when a call is delivered with very short interval of time after another call is cleared.

12.2.6. 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 an ACD call but is still occupied with work related to a previous ACD call. In this state, an agent cannot receive ACD calls but may be able to receive non-ACD calls. The agent may be performing administrative duties (e.g., updating a business order form) for a previous call, or may be involved with a non-ACD call.
Typical examples of when this event may be generated are:
- An agent completes an ACD call and goes into the workingAfterCall state. (This is a configuration option.)
- An agent invokes the Working After Call feature on the telephone.
- An agent invoked workingAfterCall state by using the Set Agent State service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
agentDevice	SubjectDeviceID	M	Yes	Indicates the device at which the agent entered the workingAfterCall state.
agentID	AgentID	C	No	
acdGroup	DeviceID	C	No	
pendingAgentState	PendingAgentState	C	No	
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

12.2.7. Auto Answer

The Auto Answer event indicates that the auto answer status has changed (On/Off) for a device.
Typical examples of when this event may be generated are:
- The auto-answer feature has been changed on the telephone.
- The computing function, on behalf of a user, has invoked the Set Auto Answer service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
invokingDevice	SubjectDeviceID	M	Yes	Indicates the device where the auto answer status has changed.
autoAnswerOn	Boolean	M	Yes	Indicates the status of the feature. Shall be one of the following: - FALSE - Auto-answer feature is not enabled. - TRUE - Auto-answer feature is enabled (on).
numberOfRings	INTEGER	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

12.2.8. Auto Work Mode

The Auto Work Mode event indicates that the auto work mode feature has changed for a specific device. The auto-work feature is used to automatically transition an agent state to the WorkingAfterCall state (from the Busy state) after an agent is finished with a call. The feature may also automatically transition the agent state from WorkingAfterCall (to Ready, for example) after a certain amount of time.
Typical examples of when this event may be generated are:
- The auto-work mode feature has been changed on the telephone.
- The computing function, on behalf of a user, has invoked the Set Auto Work Mode service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
invokingDevice	SubjectDeviceID	M	Yes	Indicates the device where the auto work mode status has changed.
autoWorkOn	Boolean	M	Yes	Indicates the status of the feature. It shall be one of the following: - FALSE - Auto-work mode off. - TRUE - Auto-work mode on.
autoWorkInterval	INTEGER	M	Yes	Indicates the number of seconds that the agent state remains in the AfterCallWork state.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	M	Specifies TDA/TDE specific private data.
device	DeviceID			(Mandatory) Specifies the DeviceID for the incoming group.

12.2.9. Call Back

The Call Back event indicates that a call back feature has been set or cancelled between two devices.
Typical examples of when this event may be generated are:
- A call back was set or a pending call back was cancelled manually from a phone.
- The computing function, on behalf of a user, set or cancelled a call back.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
originatingDevice	SubjectDeviceID	M	Yes	Indicates the DeviceID of the originating device when the call back relationship was established.
targetDevice	SubjectDeviceID	M	Yes	Indicates the DeviceID of the target device when the call back relationship was established.
callBackSetCancelled	Boolean	M	Yes	Indicates whether a call back was set or cancelled. Shall be one of the following: - FALSE - Call Back was cancelled. - TRUE - Call Back was set.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE implementation

1. In case of Call Back feature is set for external outgoing call, the targetDevice in Call Back event will be "not Known". This case could happen when no network interface device is free.

12.2.10. Call Back Message

The Call Back Message event indicates that a call back message feature has been set or cancelled between two devices.
Typical examples of when this event may be generated are:
- A call back message was set or a pending call back message was cancelled manually from a phone.
- The computing function, on behalf of a user, set or cancelled a call back message.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
originatingDevice	SubjectDeviceID	M	Yes	Indicates the DeviceID of the "return-call-to" device when the call back message relationship was established.
targetDevice	SubjectDeviceID	M	Yes	Indicates the DeviceID of the target device at which the call back message was lodged.
callBackMsgSetCancelled	Boolean	M	Yes	Indicates whether a call back message was set or cancelled. Shall be one of the following: - FALSE - Call Back Message was cancelled. - TRUE - Call Back message was set.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

12.2.11. Forwarding

The Forwarding event indicates that the forwarding feature has been changed for a device.
Typical examples of when this event may be generated are:
- The forwarding feature has been changed on the telephone.
- The computing function, on behalf of a user, has invoked the Set Forwarding service.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	SubjectDeviceID	M	Yes	Indicates the device where the forwarding feature was changed.
forwardingType	ForwardingType	O	Yes	Indicates the type of forwarding. The "internal" and "external" types refer to the type of call origination (for example an external call) that will be forwarded if it matches a forwarding type (for example forwardImmExt) enabled at the device. When forwardStatus is TRUE, the complete set of possible values is: - forwardBusyInt - forwardBusyExt - forwardNoAnsInt - forwardNoAnsExt - forwardImmInt - forwardImmExt - forwardDNDInt - forwardDNDExt When forwardStatus is FALSE, possible value is: - forwardImmInt - forwardImmExt
forwardStatus	Boolean	M	Yes	Indicates the status of the forwarding type. The complete set of possible values is: - FALSE - the forwarding type is deactivated - TRUE - the forwarding type is active
forwardTo	DeviceID	O	Yes	Specifies the destination to which calls are forwarded. It is not provided when forwardDNDInt or forwardDNDExt is set. Also forwardStatus is FALSE, it is not provided.
forwardDefault	ForwardDefault	O	No	
ringCount	INTEGER (1...100)	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	Yes	Specifies TDA/TDE specific private data.
kmeFWDType	KmeFWDType	-	Yes	(Optional) When this parameter exists, the PBX ignores the forwarding types above. When forwardStatus is FALSE, this is not provided.

TDA/TDE Implementation

1.In case of forwardStatus=FALSE and forwardingType=forwardImmInt, then the computing function shall assume that forwarding setting for internal call is turned off. On the other hand forwardingType= forwardImmExt, then the computing function shall assume that forwarding setting for external call is turned off.

13. Device Maintenance Events

13.1. Events

13.1.1. Back In Services

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

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	SubjectDeviceID	M	Yes	Indicates the device that is back in service.
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

13.1.2. Out Of Service

The Out Of Service event indicates that the device has entered a maintenance state (i.e., has been taken out of service) and can no longer accept calls and Call Control services.

Event Parameters

Parameter Name	Type	M/C/O	TDA/TDE	Description
device	SubjectDeviceID	M	Yes	Indicates the device that has been taken out of service.
cause	EventCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

TDA/TDE Implementation

1. When a device becomes out of service, existing monitors are not removed (e.g., existing MonitorCrossRefIDs remain valid). However:
   - It is possible to start a new monitor on an out of service device.
   - Event flows over an existing monitors is reduced.
   - Snapshot services results in a negative acknowledgment if attempted on an out of service device.
2. PS does not turn into out of service state even if the power is turned off.

14. Data Collection Services

14.1. Services

14.1.1. Data Collected

S -> C

The Data Collected service sends end-to-end DTMF data, as digit information, that was received over a connection to the computing function.

Request

Parameter Name	Type	M/C /O	TDA /TDE	Description
dcollCrossRefID	DcollCrossRefID	M	Yes	Specifies the cross reference identifier associated with the data collection.
digitsData	DigitsData	C	Yes	Specifies the collected DTMF digit information. Supported component of this parameter is digitsDetected only. Specifies the ASCII (IA5) sequence of DTMF digits detected. Maximum length is 32.
telTonesData	TelTonesData	C	No	
connectionInfo	ConnectionInformation	O	No	
dcollCause	DcollCause	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	

TDA/TDE Implementation

1. This service can send the DTMF data which includes;
   0,1,2,3,4,5,6,7,8,9,*,#,A,B,C and D.
2. The PBX does not support the detection of Rotary Pulse.
3. A Positive/Negative Acknowledgement will be ignored by the PBX.
4. If number of collected digits is over 32, 32 digits from the first are reported by this service.

14.1.2. Start Data Collection

C -> S

The Start Data Collection service is used to collect DTMF digits information from a connection at a specified device. Data Collection should be started on an existing connection. Data Collection continues until the Stop Data Collection service is used to terminate the collection or until the connection over which data is being collected is cleared.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
object	Station	Connected	Connected
	Routeing Device	Queued	Queued

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
object	CallObject	M	Yes	Specifies the object to which a data collection should be initiated. This must be a ConnectionID.
dataCollType	DataCollType	O	No	
digitsReportingCriteria	DigitsReportingCriteria	O	Yes	Specifies the criteria associated with the reporting of the DTMF digits. This parameter consists of the following components: - numChars (C) Value – specifies the number of characters to collect before sending the Data Collected service with the collected digit characters. Maximum=32. - flushChar (C) Character(1) – specifies an ASCII (IA5) character that, if detected, causes any previously unreported digit characters (including this character) to be sent in the Data Collected service. - timeout (C) Value – specifies a duration, in milliseconds, when any previously unreported digit characters are sent in the Data Collected service. Accepted range is from 1 to 100000. But less than 1000 is rounded down. If this parameter is provided, at least one component must be provided.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
dcollCrossRefID	DcollCrossRefID	M	Yes	Specifies the cross reference identifier associated with the data collection that has been created.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description

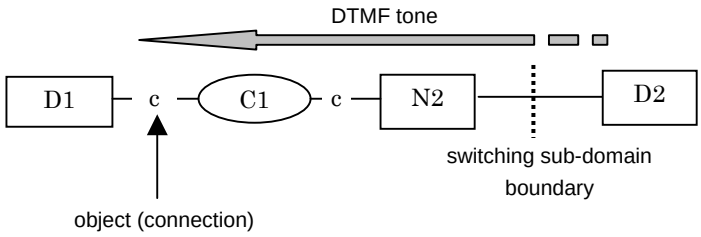
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
	invalidParameterValue	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	
UnspecifiedError	None	

TDA/TDE Implementation

1. Collection of DTMF is only supported.
2. Value of object parameter shall be a ConnecitonID as shown below.



3. This service for external calls is available only when the message card is installed in the PBX.
4. This service for internal calls does not need OGM port (DISA device).
5. A conference call is not supported as the object.
6. When the other party is an ISDN station, this request is negatively acknowledged.
7. Duplicate request to the same connection is negatively acknowledged.
8. When object connection state goes to another state, data collection is automatically stopped.

14.1.3. Stop Data Collection

C -> S

The Stop Data Collection service terminates an existing data collection.

Request

Parameter Name	Type	M/C /O	TDA /TD E	Description
dcollCrossRefID	DcollCrossRefID	M	Yes	Specifies the cross reference identifier associated with the data collection to be terminated.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	
UnspecifiedError	None	

TDA/TDE Implementation

1. The PBX will not issue this service.

15. Call Detail Record (CDR) Services

15.1. Services

15.1.1. Call Detail Records Report

S -> C

The Call Detail Records Report service provides call detail information for one or more calls.
This information may be used to derive charging information, statistic purposes, etc.

Request

Parameter Name	M/O	TDA /TDE	Description
cdrCrossRefID	M	Yes	Specifies the CDR cross reference identifier.
numberOfRecordsSet	M	Yes	Value=1(fixed)
cdrInfo	M	Yes	Specifies a record of CDR information.
recordNumber	O	No	
recordCreationTime	M	Yes	Indicates the data and time that the connection was created. This also means the time when this call started.
callingDevice	O	Yes	Indicates the calling device.
calledDevice	O	Yes	Indicates the called device.
associatedCallingDevice	O	Yes	Indicates the Network Interface Device (trunk, for example) associated with the calling device.
associatedCalledDevice	O	Yes	Indicates the Network Interface Device (trunk, for example) associated with the called device.
networkCallingDevice	O	No	
networkCalledDevice	O	Yes	Indicates the called device that was provided by the network.
callCharacteriistics	O	No	
mediaCallCharacteriistics	O	No	
chargedDevice	O	Yes	Indicates the verify code. nonOperator is only supported.
recordedCall	O	No	
nodeNumber	O	No	
tariffTable	O	No	
connectionStart	O	No	This parameter is not used. Instead recordCreationTime is used.
connectionEnd	O	Yes	Indicates the data and time that the connection ended.
connectionDuration	O	Yes	Indicates the duration of the connection, in tenths of seconds.
accessCode	O	No	
carrier	O	No	
selectedRoute	O	No	
billingIdentifier	O	Yes	Indicates the type of charging. This information is obtained from condition code. - normalCharging - reverseCharging - creditCardCharging ... Not used - callForwarding - callDeflection ..... Not used - callTransfer - other
chargingInfo	O	Yes	Currency unit only.
suppleServiceInfo	O	No	
reasonForTerm	O	No	
authCode	O	No	
accountInfo	O	Yes	Indicates the account code used for the call.
deviceCategory	O	No	
namedDeviceTypes	O	No	
operatorDevice	O	No	

privateData	O	Yes	Condition code This is not provided when billingIdentifier is normalClearing. cl -- Reverse Charging tr -- Call Transfer fw -- Call Forwarding d0 -- DISA/TIE rm -- Remote Maintenance na -- No Answer

Positive Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TDE	Description
universalFailure	UniversalFailure	M	Yes	

TDA/TDE Implementation

1. The value for the cdrInfo is basically same as SMDR.

Mapping the billingIdentifier

・The conditions of SDMR are mapped into the billingIdentifier. There are three condition codes that correspond to "other". To prevent this, it is necessary for the privateData to be added a condition code as a non-standardised parameter.

billingIdentifier	SMDR Condition Code
normalCharging	There is no condition code.
reverseCharging	CL : Collect Call
creditCardCharging	Not applied
callForwarding	FW : Forward to Trunk
callDeflection	Not applied
callTransfer	TR : Transfer
other	D0 : Trunk Access from External Call RM : Remote Access to a Modem NA : No Answer

2. The PBX retries to send this service when the computing function returns a negative acknowledgement or returns nothing. If the service request still fails, PBX will send A-Abort and disconnet the association. This will be recorded into PBX error log.

3. The PBX set value of CallingDevice, CalledDevice, etc as follows.

a) External Outgoing Call

Parameters	Value	Type
callingDevice	Specifies calling station device (Extension number)	NumberDigits, OtherPlan* (ISDN ext.)
calledDevice	Specifies called directory number	NumberDigits *
associatedCallingDevice	None	
associatedCalledDevice	Specifies the Network Interface Device that is associated with the called device.	DeviceNumber
networkCalledDevice	None	

* Switching Function Representation format

b) External Incoming Call

Parameters	Value	Type
callingDevice	Specifies Caller ID & name provided by the network	OtherPlan *
calledDevice	Specifies called station device (Extension number)	NumberDigits, OtherPlan* (ISDN ext.)
associatedCallingDevice	Specifies the Network Interface Device that is associated with the calling device.	
associatedCalledDevice	None	DeviceNumber
networkCalledDevice	DDI & name	OtherPlan *

c) Internal Call

Parameters	Value	Type
callingDevice	Specifies calling station device (Extension number)	NumberDigits, OtherPlan* (ISDN ext.)
calledDevice	Specifies called station device (Extension number)	NumberDigits, OtherPlan* (ISDN ext.)
associatedCallingDevice	None	
associatedCalledDevice	None	
networkCalledDevice	None	

4. When value of "Decimal Point" is set as more than 2 by TDA/TDE Maintenance Console, value of chargingInfo becomes invalid.
5. Data type of DeviceID of Switching Function Representation Format is OtherPlan(OCTET STRING) type (not NumberDigits type).
6. Relation of callingDevice and chargedDevivce is as follows.

Type of Call	callingDevice	chargedDevice
Normal call	Real calling extension number	Omitted
With Walking COS	Extension number specified by Walking COS	Omitted
With Walking COS & Verify Code	Real calling extension number	Verify code

15.1.2. Start Call Detail Records Transmission

C -> S

The Start Call Detail Records Transmission service starts the transmission of Call Detail Records. The PBX starts transmitting call detail information at the end of each call.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
transferMode	CDRTransferMode	M	Yes	The PBX sends the requested information after the end of each call. It is because supported mode of transmission is transferAtEndOfCall only.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
cdrCrossRefID	CDRCrossRefID	M	Yes	Specifies the CDR cross reference identifier.
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return"

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	Invalid transferMode
UnspecifiedError	None	

TDA/TDE Implementation

1. The PBX always stores CDR (Call Detail Record).
   When the service is requested, the possible movements are following.
   Case A: There is more than one CDR previously stored in the PBX.
      1) The PBX sends all the CDR reports.
      2) After sending all the pre-stored CDR reports, the PBX sends a CDR report every time a call is ended.
   Case B: There is no CDR report stored in the PBX.
      1) The PBX sends a CDR report every time a call is ended.

2. This request is ignored when another StartCallDetailRecordsTransmission has already issued.
3. Value of cdrCrossRefID is fixed.

15.1.3. Stop Call Detail Records Transmission

C -> S

The Stop Call Detail Records Transmission service is used to cancel a previously initiated Start Call Detail Records Transmission service.
A positive acknowledgement to the service request indicates that the CDR cross reference identifier used in the Start Call Detail Records Transmission service has become invalid.

Request

Parameter Name	Type	M/C/O	TDA/TDE	Description
cdrCrossRefID	CDRCrossRefID	M	Yes	Specifies the CDR cross reference identifier.
cdrTermReason	CDRTermReason	O	No	
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Positive Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
security	CSTASecurityData	O	No	
privateData	CSTAPrivateData	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	

TDA/TDE Impementation

1. The PBX will not issue the service.

16. Vendor Extensions Specific Services & Events

Abstract Syntax for escape service is defined as follows in ECMA 285. TDA/TDE specific services and events are defined in KMESpecificPrivateData data type.

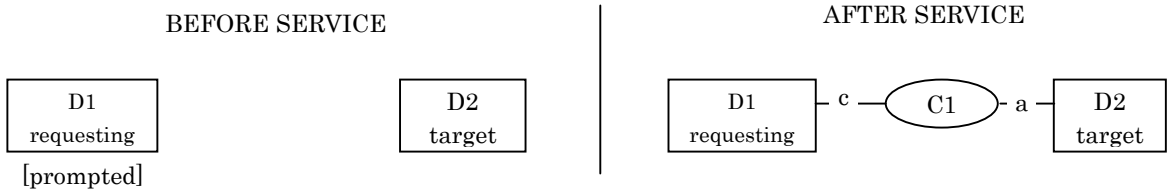
```
escape OPERATION ::=
{       ARGUMENT        EscapeArgument
        RESULT          EscapeResult
        ERRORS          {universalFailure}
        CODE            local: 51
}

EscapeArgument ::= SEQUENCE
{       escapeRegisterID    EscapeRegisterID OPTIONAL,
        security            CSTASecurityData OPTIONAL,
        privateData         CSTAPrivateData }

EscapeResult ::= CHOICE
{       extensions          CSTACommonArguments,
        noData              NULL}

PrivateEvent ::= SEQUENCE
{       security            CSTASecurityData OPTIONAL,
        privateData         CSTAPrivateData }


CSTACommonArguments ::= [APPLICATION 30] IMPLICIT SEQUENCE
{       security            [0] IMPLICIT CSTASecurityData OPTIONAL,
        privateData         [1] IMPLICIT SEQUENCE OF CSTAPrivateData OPTIONAL }

CSTAPrivateData ::= CHOICE
{       string              OCTET STRING,
        private             KMESpecificPrivateData}
```

16.1. Services

16.1.1. KmeCallBackInvoke

C -> S

When CallBack feature prompts the requesting device to go off-hook, the PBX issues Private(CallBackNotification)-Event. The KmeCallBackInvoke service is used to making a call to the target device instead of user's off-hook.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(requesting device)	Station *1	Null	Connected
	Voice Unit		
(target device)	Station	Null	Alerting
	Network Interface		

*1 Except SLT

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.callBackInvoke.request

Parameter Name	Type	M/C/O	Description
callBackID	OCTET STRING (SIZE(0..4))	M	This is provided by CallBackNotification event.
requestingDevice	DeviceID	M	RequestingDevice
targetDevice	DeviceID	O	TargetDevice (Set station device only)

Result

[OPERATION]
EscapeResult.extensions.privateData.private.kmeCallControl.callBackInvoke.result

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	ConnectionID of callback call(D1C1).

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

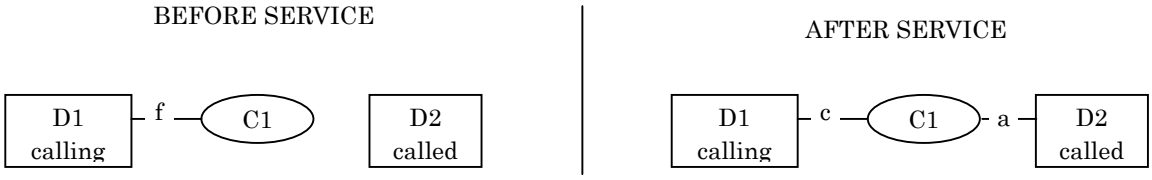
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidparameterValue	Invalid CallBackID
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

16.1.2. KmeDndOverride

C -> S

The KmeDndOverride service allows incoming calls to override DND settings so as to call the target device.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Failed	Connected Failed
(target device)	Station	Null	Alerting Null

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.dndOverride

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	Subject connection (D1C1)

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
	privilegeViolationSpecifiedDevice	Regulation
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

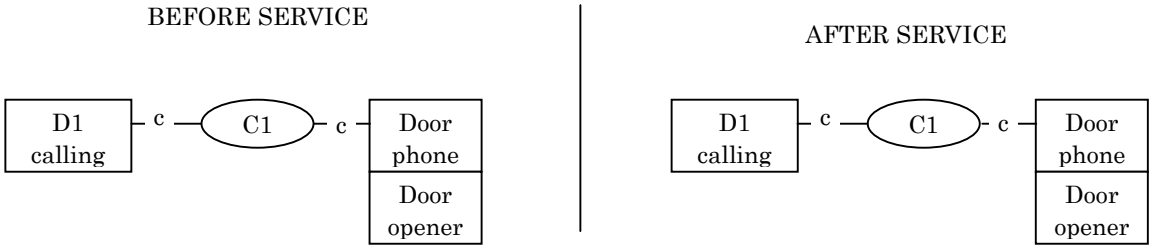
TDA/TDE Implementation

1. When an error occurs due to the Class of Service restriction on the calling device, the PBX negatively acknowledges.
2. Even if the PBX positively acknowledges, this service may fail and Failed event will be generated.

16.1.3. KmeDoorOpen

C -> S

The KmeDoorOpen service is used to open the door opener. Door Open is executed only when having a door phone conversation.
This service does not affect any of connections.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Connected	Connected
(target)	Door Phone	Connected	Connected

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.doorOpen

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	Subject connection (D1C1)

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.4. KmeExtendedDataAccess

C -> S

This service is used to send a message of Programming Interface. This service does not affect any of connections.

Request

[OPERATION]
EscapeArgument.privateData.private.kmeExtendedDataAccess

Parameter Name	Type	M/C/O	Description
kmeExtendedDataAccess	OCTET STRING (SiZE(0..200))	M	Programming specific message

Positive Acknowledgement

[OPERATION]
EscapeResult.extensions.privateData.private.kmeExtendedDataAccess

Parameter Name	Type	M/C/O	Description
kmeExtendedDataAccess	OCTET STRING (SiZE(0..200))	M	Programming specific message

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

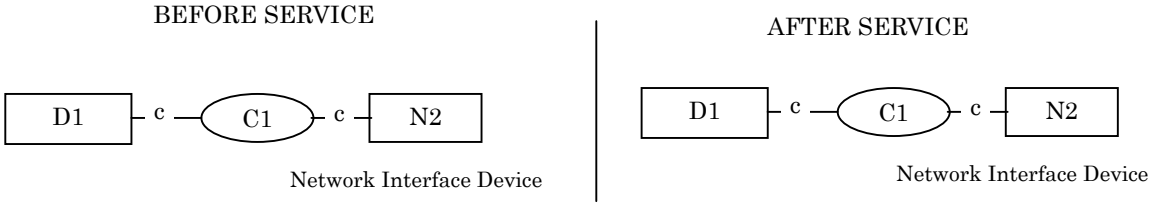
Error Return

Category	Error Name	Error Cause
OperationErrors	serviceNotSupported	First party application cannot request this service.
UnspecifiedError	None	

16.1.5. KmeExternalFeatureAccess

C -> S

This service is used to request the PBX to send Flash signal to a specific connection (D1C1) after seizing a trunk. This service does not affect any of connections.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Connected	Connected
(target)	Network Interface	Connected	Connected

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.eFA

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	Subject connection (D1C1)

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.6. KmeGetSystemData

C -> S

The KmeGetSystemData service is used to get system data in the PBX. The types of system data are grouped into five categories.

1. System Data (Data of the whole system of the PBX)
2. Device Data (Data of a extension device)
3. Trunk/Extension Group Member (Data of members in a trunk group and an extension group)
4. Incoming Group Member (Data of members in an incoming group)
5. Device List (List of devices implemented in the PBX)
6. Voice Mail Group Member (Data of members in a voice mail group)

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.getSystemData.request

System Data

Parameter Name	Type	M/C/O	Description
systemData	ENUMERATED	M	Specifies a request out of the following: sysTimeStamp — Time stamp of PBX. This is unavailable for 1st party applications except PCC PC Console. ~~devTimeStamp~~ — Not used featureList — List of Feature numbers ~~speedDial~~ — System speed dialling trunkGroup — Trunk group Information extensionGroup — Extension group Information pickupGroup — Pickup group Information pagingGroup — Paging group Information incomingGroup — Incoming call group Information dayNightMode — Day/Night modes doorPhone — Door phone Information vmGroup — Voice Mail group Information manufacturerName — The name of PBX manufacturer(Fixed) subdomainName — The name of PBX(Fixed) softwareVersion — Software version of the PBX ctiVersion — CTI interface version(Fixed) regionCode — Codes of region systemTime — System time numberOfMsgPort — The number of OGM message ports and number of free ports. psGroup — PS(wireless) Group Information whoAmI — Extension number of connected line(1'st party interface only) broadcastGroup — List of broadcast group information pbxType — Type number of TDA/TDE series PBX externalSensor — External sensor information svm — Simlified Voice Message information pdnGroup — PDN group information

Device Data

Parameter Name	Type	M/C/O	Description
device	DeviceID	M	
sysData	CHOICE	M	
standardInfo	BIT STRING		Specifies a request out of the following. Multiple bits are able to be set. wakeUp: Timed Reminder information remoteStatationLock: Remote station lock status callLogLock: Call log lock status absentMessage: Absent message forwardDnd: Forward/DND information for PC Console only cos: Class Of Service of an extension line phoneProperty: Telephone information assocIncomGroup: List of incoming groups associated messageWaiting: Devices requested Message Waiting assocExtGroup: Joining Extension Group
extName	NULL		Name of specified extension line
fcoKey	NULL		Flexible key information
sxdpMaster	NULL		Master PT information of PS which is set as SXDP(Wireless XDP)

Trunk Group / Extension Group Members

Parameter Name	Type	M/C/O	Description
groupNo	INTEGER	M	ID number of Trunk group or Extension group
groupType	ENUMERATED	M	Specifies one of the following: trunkGMembers: Trunk group information extGMembers: Extension group information

Incoming Group Members

Parameter Name	Type	M/C/O	Description
groupNo	DeviceID	M	Specifies DeviceID of an incoming group

Device List

Parameter Name	Type		M/C/O	Description
deviceList	CHOICE		M	
		device		DeviceID (DiallableDigit type or DeviceNumber type)
		category		KmeDeviceCategory

KmeDeviceCategory

1. CSTA standard device category

acd	None
group	Incoming group
networkInterface	Trunk device
park	Park device
routeingDevice	Incoming group(ACD mode)
station	Extension device
voiceUnit	Voice Mail Port
other	Error

2. TDA/TDE specific device category

vm	Voice Mail Group
doorPhone	Door Phone
disa	DISA
pagingGroup	Paging Group
psGroup	PS (Wireless) Group
externalRinger	External Ringer (Not supported in version 1.0)
externalSensor	External Sensor (Not supported in version 1.0)
externalPager	Speaker
modem	Modem
hdlc	ISDN modem
pbxSystem	PBX
tam	Simlified Voice Message

Voice Mail Group Members

Parameter Name	Type	M/C/O	Description
vmGMember	DeviceID	M	Specifies DeviceID of a voice mail group

Speed Dial

Parameter Name	Type	M/C/O	Description
serialNumber	INTEGER(0..999)	M	Start point of system speed dial entry range
number	INTEGER(1..1000)	M	Number of entries. Aceeptable number is as follows. First Party IF ... 10 Third Party IF ... 50
tenantNo	INTEGER(1..8)	O	Specify tenant number. If nothing is specified, PBX interprets as follows. First Party IF ... Tenant number which the extension belongs to. Third Party IF ... Tenant number = 1 If the PBX has extended memory, computing function can get system speed dial for each tenant. If the PBX does not have extended memory, this parameter is ignored and common system speed dial is returned.

Broadcast Group Members

Parameter Name	Type	M/C/O	Description
broadcastGMembers	INTEGER	M	Specifies group number of a broadcast group

Positive Acknowledgement

[OPERATION]
EscapeResult.extensions.privateData.private.kmeSystemData.getSystemDataPosAck

Parameter Name	Type	M/C/O	Description
posAck	KmeGetSystemDataPosAck	M	Cross Reference Identifier

Negative Acknowledgement

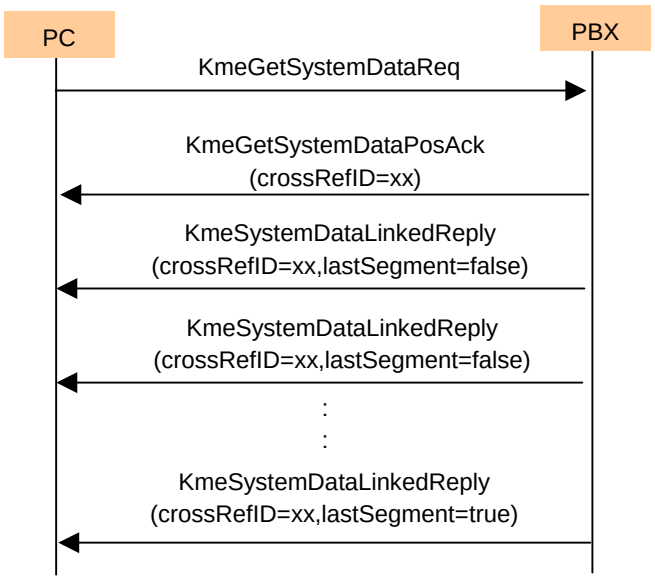
Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	
	invalidDeviceIdentifier	No such device
	invalidObjectType	Invalid deviceID type
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

TDA/TDE Implementation

1. Normal message sequence of KmeGetSystemData is as follows.

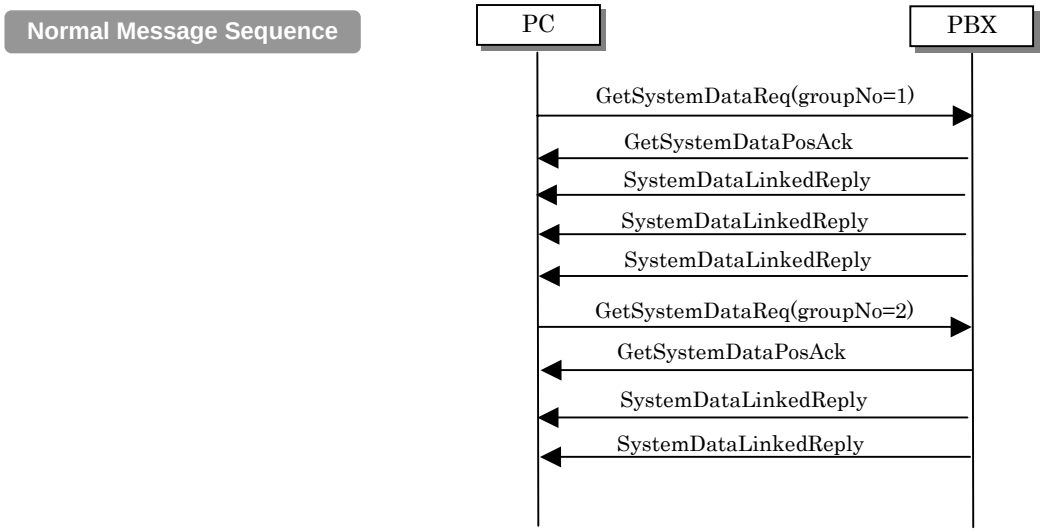


2. Some of system data can be retrieved by special key information like wild card for speeding up data transfer. System data which wild card is available is as follows.

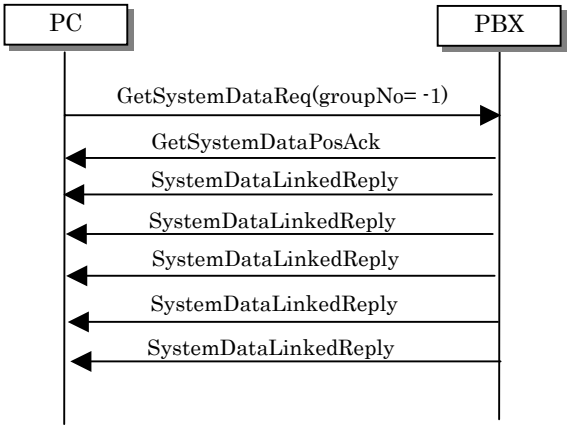
System Data which wild card is available	Key Parameter (Data Type)	How to Specify	
		Length	Value
Extension Group Members	groupNo(INTEGER)	1	-1
Trunk Group Members	groupNo(INTEGER)	1	-1
Incoming Group Members	grpDevice(DeviceID)	0	N/A
deviceData	device(DeviceID) *1	0	N/A

*1 Data type of deviceData should be NumberDigits type.

Following figure shows the difference of message sequence between normal GetSystemData and GetSystemData with wild card.



Wild Card Message Sequence



16.1.7. KmeGetSystemDataRevision

This service is used get system data revision of each data block.

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.getDataRevisionRecord.request

Parameter Name	Type	M/C/O	Description
request	KmeRevisionType	M	Specifies either system data revision or speed dial revision.

Positive Acknowledgement

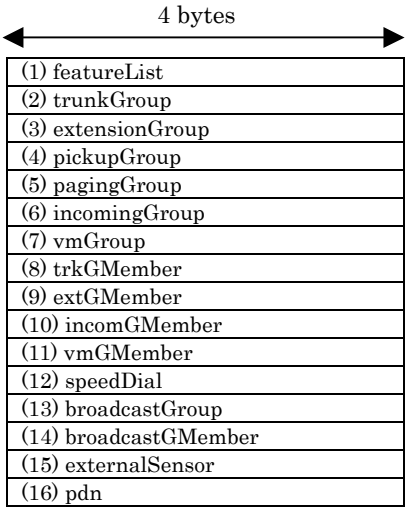
[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.getDataRevisionRecord.result

Parameter Name	Type	M/C/O	Description
result	KmeSystemDataRevision	M	Revision infromation

TDA/TDE Implementation

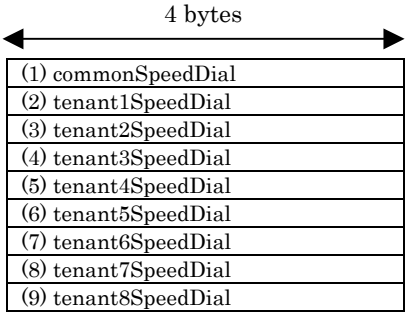
1. Data structure of SystemDataRevision

Each system data block is 4 bytes and they are concatenated as follows(OCTET String：4*16=64 bytes)



2. Data structure of SystemSpeedDialRevision

Each system speed dial block is 4 bytes and they are concatenated as follows(OCTET String：4*9=36 bytes).



16.1.8. KmeGuestCheckIn

This is one of room status control feature (PBX hospitality features).
This service is used to change the status of a guest room associated with an extension to check-in.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
guestCheckIn	Station	None	None

Request

[OPERATION]
EscapeArgument.privateData.private.kmeHotelControl.guestCheckIn

Parameter Name	Type	M/C/O	Description
guestCheckIn	DeviceID	M	Extension number of a guest room which room status is changed.

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.9. KmeGuestCheckOut

This is one of room status control feature (PBX hospitality features).
This service is used to change the status of a guest room associated with an extension to check-out.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
guestCheckOut	Station	None	None

Request

[OPERATION]
EscapeArgument.privateData.private.kmeHotelControl.guestCheckOut

Parameter Name	Type	M/C/O	Description
guestCheckOut	DeviceID	M	Extension number of a guest room which room status is changed.

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

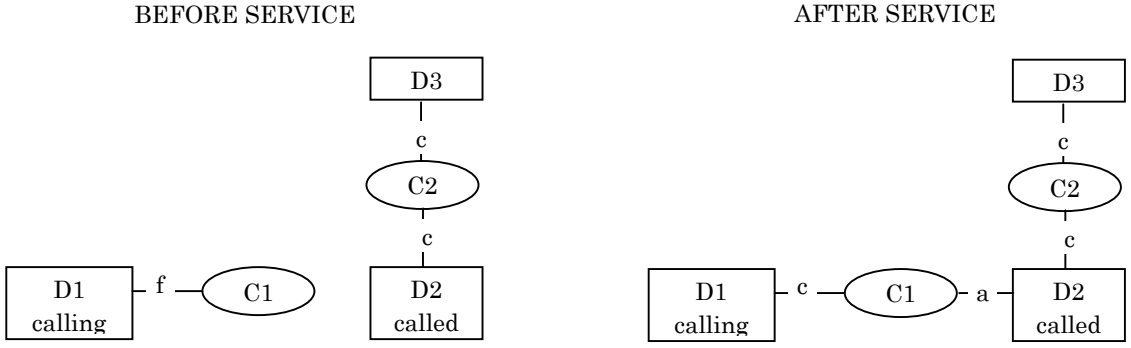
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.10. KmeInterruptCall

C -> S

This service is used to interrupt the CalledDevice that is in busy state. After that, it becomes BSS, OHCA or W-OHCA, depending on the CalledDevice feature setting.
This service allows a called device to have two connections of connected state at the same time, which makes a difference from that of CSTA IntrudeCall (Case B).



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Failed(C1)	Connected(C1)
(target)	Station	Connected(C2)	Connected(C2) Alerting(C1)

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.interuptCall

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	Subject connection (D1C1)

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.11. KmeLockSystemData

C -> S

This service is used to lock system data in the PBX. Locking is needed in case of changing certain system data. Refer to KmeSetSystemData to see what data needs to be locked.

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.lockSystemData.request

Parameter Name		Type	M/C/O	Description
systemDataLock		BOOLEAN	M	true:lock, false:unlock
CHOICE			M	
	lock	DeviceID	-	This parameter is used when systemDataLock=true as the requesting device.
	unlock	KmeSystemCrossRefID	-	This parameter is used when systemDataLock=false. KmeSystemCrossRefID is provided in KmeLockSystemData positive acknowledgement when lock=true is requested.

Positive Acknowledgement

[OPERATION]
EscapeResult.extensions.privateData.private.kmeSystemData.lockSystemData.lockResult

Parameter Name	Type	M/C/O	Description
lockResult	KmeSystemCrossRefID	M	This id is needed for unlocking the system data.

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	
	invalidDeviceIdentifier	No such device
	invalidObjectType	Invalid deviceID type
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	System data is already locked
SystemResourceAvailabilityErrors	deviceOutOfService	
UnspecifiedError	None	

TDA/TDE implementation

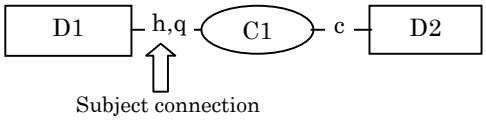
1. A first party application shall set own extension number to lock(DeviceID) parameter as the requesting device. A third party application shall set **0x03000000**(fixed) to lock(DeviceID) parameter instead of extension number.

16.1.12. KmeOgmStart

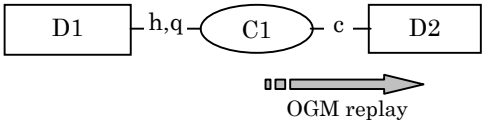
C -> S

This service is used to start playing OGM on a specific connection. Number of OGM replayed simultaneously depends on number of free DISA devices (OGM port).
This service does not affect any of connections.

BEFORE SERVICE



AFTER SERVICE



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station (PT,SLT)	Held	Held
	Routeing Device	Queued	Queued

Request

[OPERATION]
EscapeArgument.privateData.private.kmeResourceControl.ogmStart

Parameter Name	Type	M/C/O	Description
connection	ConnectionID	M	Subject connection (D1C1)
ogmId	INTEGER	M	1..64

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

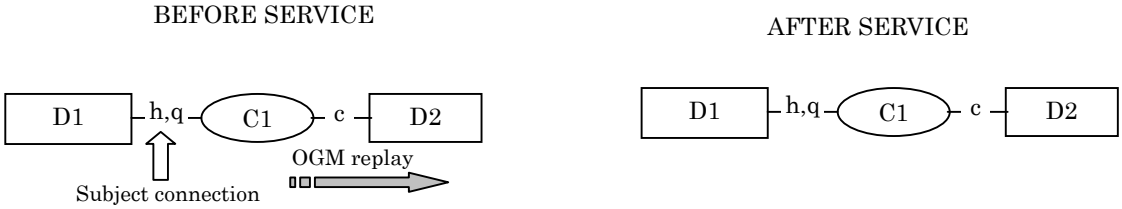
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	invalidParameterValue	
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	OGM port is busy
UnspecifiedError	None	

16.1.13. KmeOgmStop

C -> S

This service is used to stop OGM playback on the specified connections.
This service does not affect any of connections.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Held	Held
	Routeing Device	Queued	Queued

Request

[OPERATION]
EscapeArgument.privateData.private.kmeResourceControl.ogmStop

Parameter Name	Type	M/C/O	Description
(connection)	ConnectionID	M	Subject connection (D1C1)

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.14. KmePDFStart

This service enables Physical Device Features Mode of specified PS.

Supported Device/State

State \ Extension Type		PS
Normal	PT Programming	No
	Idle	Yes
	Other state	No
CTI Control	-	Yes *

Request

[OPERATION]
EscapeArgument.privateData.private. kmePDFControl.pDFStart

Parameter Name	Type	M/C/O	Description
Device	DeviceID	M	Subject device

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	Device is out of CS area or not registered
UnspecifiedError	None	

TDA/TDE Implementation

1. This service is available for KX-TD7680,KX-TD7690,KX-TD7590CE,KX-TCA255,KX-TCA155.

16.1.15. KmePDFStop

This service disables Physical Device Features Mode.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
Device	PS Station	Null	Null

Request

[OPERATION]
EscapeArgument.privateData.private.kmePDFControl.pDFStop

Parameter Name	Type	M/C/O	Description
Device	DeviceID	M	Subject device

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	deviceOutOfService	Device is out of CS area or not registered
UnspecifiedError	None	

16.1.16. KmeRoomCleanUp

This is one of room status control feature (PBX hospitality features).
This service is used to change the guest room's cleaning status associated with an extension. This request is toggle action. If this is requested during Ready state, the state is changed to NotReady.

Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
cleanUp	Station	None	None

Request

[OPERATION]
EscapeArgument.privateData.private.kmeHotelControl.cleanUp

Parameter Name	Type	M/C/O	Description
cleanUp	DeviceID	M	Extension number of a guest room which room cleaning status is changed.

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.17. KmeSetProgrammingEventOn

This service enables or disables KmeSystemDataChanged event due to TDA/TDE Maintenance Console.

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.setprogrammingEventOn.request

Parameter Name	Type	M/C/O	Description
programmingEventOn	BOOLEAN	M	TRUE: Enable, FALSE: Disable

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
UnspecifiedError	None	

16.1.18. KmeSetSystemData

C -> S

This service is used to change system data. The types of system data are grouped into three categories.

1. System Data — Data of the whole system of the PBX
2. Device Data — Data of an extension device
3. ACD Queue — Queue of incoming groups

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.setSystemData

System Data

Parameter Name	Type	M/C/O	Description
CHOICE		M	
speedDial	KmeSpeedDial		Speed dial
dayNightMode	KmeDayNightMode		Day/Night mode
time	GeneralizedTime		System time
extNo	KmeChangeExtNo		Extension number for incoming group, voice mail group and PS group only available.
name	KmeChangeName		Name for incoming group, voice mail group and PS group only available.
subdomainName	IA5String(SIZE(0..20))		Name of PBX
tenantSpeedDial	KmeTenantSpeedDial		Speed dial *2
distributionMethod	KmeDistributionMethod		Specify UCD, HUNTING or RING

Device Data

Parameter Name	Type	M/C/O	Description
device	DeviceID	M	
sysData (CHOICE)		M	
wakeUp	KmeWakeUpInfo		Wakeup setting
remoteLock	KmeDeviceLock		Remote lock
forwardDnd	KmeSetForwardInfo		Forward/DoNotDisturb for 1st Party Applications
absentMessage	KmeAbsentMessage		Absent Message
passwordClear	NULL		Password delete
extNumber	IA5String(SIZE(1..5))		Extension number. Subject device shall be OUS.
extName	KmeExtName		Extension name
cos	INTEGER		Class Of Service assigned to extension
joinGroup	DeviceID		Joins incoming call group member.
leaveGroup	DeviceID		Leaves incoming call group member.
inService	BOOLEAN		Device Status True=INS or False=OUS
fcoKey	KmeFcoKeyList		Assignmet of function to fco keys.

Acd Queue

Parameter Name	Type	M/C/O	Description
device	DeviceID	M	DeviceID of the incoming group
attribute		M	
groupType	KmeDistribution		Not used
acdMode	Boolean		true=ACD mode ON
ctiWaitTime	INTEGER		Second(range is from 0 to 255) Zero means infinite.

Note : [ ] means that locking is needed to modify the value.

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C /O	TDA /TD E	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C /O	TDA /TD E	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidParameterValue	Requested parameter value is invalid.
	invalidDeviceIdentifier	No such device
	invalidObjectType	Invalid DeviceID type
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	Locking is needed
SystemResourceAvailabilityErrors	deviceOutOfService	Device, Resource is OUS
UnspecifiedError	None	

*1 If MEC(Memory Extended Card) exists:
- From 1st-party interface : Speed dial information of a tenant which own extension is belongs to is returned.
- From 3rd-party interface : Speed dial information of tenant number 1 is returned (fixed).

*2 Available only if MEC exists.

*3 If this parameter is specified, a UniversalFailure will be returned.

TDA/TDE implementation

1. To change extension number of a station device, the device state shall be OUS. When the state is changed to OUS, all connections associated with the device are cleared.
2. There are requested conditions on changing extension number.
   OUS state : Station, Voice Unit
   No connection is associated : Group, PSG, VMG, ExternalPager, ExternalRinger
   Impossible to change : Modem, Hdlc
3. If extension number of a device who is a member of an incoming group is changed, data consistency is lost.
4. How to clear alterable system data are as follows.

System Data	How to clear
speedDial	Set serialNumber only.
wakeUp	Set noSchedule to KmeWakeUpSchedule.
forwardDnd	Set activateForward = false and length of forwardDN=zero(NumberDigits type).
absentMessage	Set length of value is zero.

5. Request of changing wakeUp and absentMessage are not available when target device is out of service.
6. Valid characters for registeredDigits(speedDial) and forwardDN(forwardDnd) are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, #, *, A, B, C, D and comma (means pause). A comma is converted into "P" in PBX.
7. Maximum number of entries which can be set by a request is:
   tenantSpeedDial 3
   fcoKey 6
   dayNightMode 1 (tenant)

16.1.19. KmeSystemDataLinkedReply

S -> C

The KmeSystemDataLinkedReply service is used by the PBX to provide a list of requested system data. This service is generated as a result of the KmeGetSystemData service.

Request

[OPERATION]
EscapeArgument.privateData.private.kmeSystemData.systemDataLinkedReply

Parameter Name	Type	M/C /O	Description
crossRefID	ServiceCrossRefID	M	Specifies the cross reference used to associate the KmeSystemDataLinkedReply service request to the KmeGetSystemData service request.
segmentID	INTEGER	M	Specifies the segment number of this message. Each successive segment number in the sequence increments the segmentID by one.
lastSegment	BOOLEAN	M	Specifies if this segment is the last one associated with the linkedId. The complete set of possible values is: • TRUE – Indicates that this is the last segment • FALSE – Indicates that this is not the last segment in the sequence
sysData	KmeGetSystemDataRsp	M	See Data structure of KmeGetSystemDataRsp

Positive Acknowledgement

None

Negative Acknowledgement

None

Data structure of KmeGetSystemDataRsp

System Data

Parameter Name	Type	M/C/O	Description
timeStamp	KmeTimeStamp	O	Latest time when system data was changed
featureList	KmeFeatureList	O	List of Feature number
speedDial	KmeSpeedDial	O	System speed dial information
trunkGroup	KmeExtTrkGroupList	O	Trunk group information
extGroup	KmeExtTrkGroupList	O	Extension group information
pickGroup	KmePckPagGroupList	O	Pick up group information
pagingGroup	KmePckPagGroupList	O	Paging group information
incomingGroup	KmeIncomingGroupList	O	Incoming group information
dayNightMode	KmeDayNightMode	O	Day/Night mode
vmGMembers	KmevmGMembers	O	Member information of vm group
doorPhone	KmeDoorPhone	O	Door phone information
vmGroup	KmeVmGroupList	O	Voice Mail group information
manufacturerName	IA5String(SIZE(0..64))	O	The name of PBX manufacturer
subdomainName	IA5String(SIZE(0..20))	O	The name of PBX
softwareVersion	IA5String(SIZE(0..32))	O	Software version of the PBX
ctiVersion	IA5String(SIZE(0..32))	O	CTI interface version V1.000..V1.0053 1.000 V1.0054 1.054 V1.006 1.054 V1.100 1.100 V2.000 2.000 V2.001 2.001 V2.100 2.100 V3.000 3.000 V3.100 3.100 V4.000(TDE v1.0) 4.000
regionCode	IA5String(SIZE(0..32))	O	Codes of region
systemTime	GeneralizedTime	O	System time
numberOfMsgPort	NumberOfMsgPort	O	The number of message ports and number of free port
psGroup	KmePckPagGroupList	O	PS (wireless) group
you are	DeviceID	O	Extension number of the line(1'st party interface only)
extName	OCTET STRING(SIZE(0..20))	O	The name of extension
broadcastGroup	KmebroadcastGroup	O	Broadcast group information
broadcastGMembers	KmebroadcastGMembers	O	Member information of broadcast group
fcoKeyList	KmefcoKeyList	O	List of key list
sxdpMaster	IA5String(SIZE(0..5))	O	SXDP master information
pbxType	INTEGER	O	Type number of the TDA/TDE PBX TDA100 ... 0 TDA200 ... 1 TDA30 ..... 2 TDA50 ..... 3 TDA15 ..... 5 TDA600 … 6 TDE100 … 7 TDE200 … 8 TDE600 … 9 NCP500 ... 10 NCP1000 ... 11 NCP3000 ... 12
externalSensor	KmeExternalSensorList	O	External sensor information
svm	Kmesvm	O	SVM information
pdnGMembers	KmepdnGMembers	O	Member infornation of PDN

Device Data

Parameter Name	Type	M/C/O	Description
wakeUp	KmeWakeUpInfo	O	Timed Reminder information
remoteLock	KmeDeviceLock	O	Remote station lock status
callLogLock	KmeDeviceLock	O	Call log lock status
absentMessage	KmeAbsentMessage	O	Absent message
forwardDnd	ForwardList	O	Forward/DND info for PC Console only
cos	INTEGER	O	Class Of Service of the extension line
phoneProperty	KmePhonePropert	O	Telephone information
assocIncomGroup	KmeGroupMembers	O	List of incoming groups associated
messageWaiting	SEQUENCE OF DeviceID	O	Devices requesting message waiting
assocExtGroup	INTEGER	O	Joining extension group
fcoKey	KmeFcoKeyInformation	O	Information of flexible CO keys
sxdpMaster	DeviceID	O	DeviceID of a PT which SXDP is configured.

Trunk Group / Extension Group Members

Parameter Name	Type	M/C/O	Description
trkGMembers	KmeTrkMembers	O	Members in the list of the trunk group
extGMembers	KmeExtMembers	O	Members in the list of the extension group

Incoming Group Members

Parameter Name	Type	M/C/O	Description
incomGMembers	KmeIcmGrpMembers	O	Members in the list of the incoming group

Device List

Parameter Name	Type	M/C/O	Description
deviceList	KmeDeviceStateList	O	Available information - DeviceID - Extension number - INS/OUS

TDA/TDE Implementation

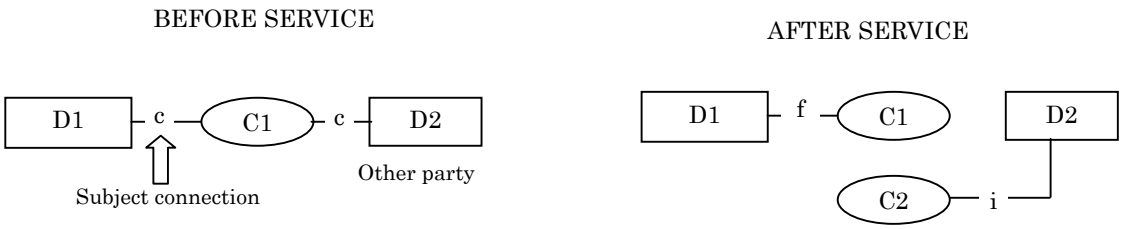
Return result of DeviceList

Category	Information in Result		
	DeviceID	ExtNo	INS/OUS
Station	DeviceNumber	Extension Number	INS or OUS
Network Interface	DeviceNumber	CO Number	INS or OUS
Park	DeviceNumber	Area Number	INS
Group	DeviceNumber	Extension Number	INS or OUS
Voice Unit	DeviceNumber	Extension Number	INS or OUS
Voice Mail Group (vm)	DeviceNumber	Extension Number	INS or OUS
Door Phone	DeviceNumber	None	INS or OUS
DISA	DeviceNumber	None	INS or OUS
Paging Group	DeviceNumber	None	INS
PS Group	DeviceNumber	Extension Number	INS or OUS
External Sensor	DeviceNumber	Extension Number	INS or OUS
External Pager	DeviceNumber	Extension Number	INS or OUS
Modem	DeviceNumber	Extension Number	INS or OUS
Hdlc	DeviceNumber	Extension Number	INS
System	DeviceNumber	None	INS
tam	DeviceNumber	Extension Number	INS or OUS

16.1.20. KmeTempTollChange

C -> S

This service is used to change COS(Class of Service) restriction level of the target device (extension only) on only the following one call (Dial Tone Transfer). The levels 1 through 7 are available.
Requesting device shall be an operator extension.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Connected	Null Failed
(other party)	Station	Connected	Initiated

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.tempTollChange

Parameter Name	Type	M/C/O	Description
connection	ConnectionID	M	Subject connection (D1C1)
tollLevel	INTEGER	M	outgoing restriction level

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

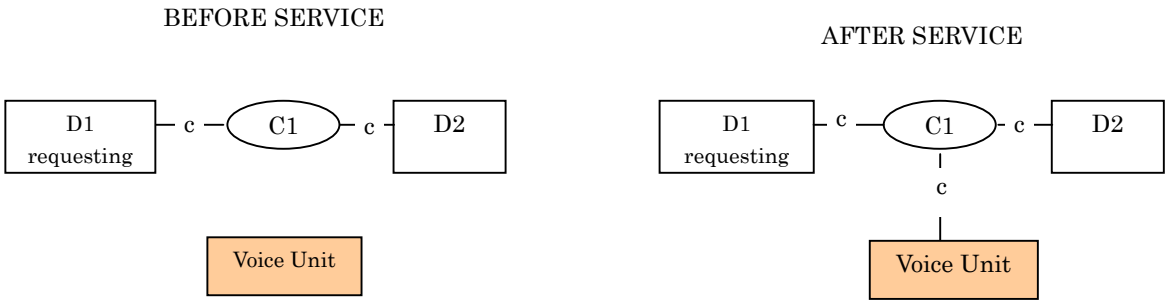
Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	invalidParameterValue	Invalid toll level
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
UnspecifiedError	None	

16.1.21. KmeTwoWayRec

C -> S

This service is used to execute Two-Way Recording. The message is stored in the requesting device's mailbox.
If this service is requested during 2 way recording, the recording is terminated.



Supported Device/State

Parameter	DeviceCategory	State	
		Before	After
(connection)	Station	Connected	Connected

Request

[OPERATION]
EscapeArgument.privateData.private.kmeCallControl.twoWayRec

Parameter Name	Type	M/C/O	Description
connection	ConnectionID	M	Subject connection (In case of D1C1, message is stored in the D1 mailbox).
vmGroupExtNo	IA5String (SIZE (1..5))	M	Extension number of VM group

Positive Acknowledgement

[OPERATION]
EscapeResult.noData

Parameter Name	Type	M/C/O	TDA/TDE	Description
noData	NULL	O	No	

Negative Acknowledgement

Parameter Name	Type	M/C/O	TDA/TDE	Description
universalFailure	UniversalFailure	M	Yes	See "Error Return".

Error Return

Category	Error Name	Error Cause
OperationErrors	invalidDeviceIdentifier	No such device
	invalidConnectionIdentifier	No such connection
	requestIncompatibleWithObject	
StateIncompatibilityErrors	invalidObjectState	
SystemResourceAvailabilityErrors	resourceBusy	Voice Mail is busy
UnspecifiedError	None	

16.2. Events

16.2.1. KmeCallBackNotification

The KmeCallBackInvoke service indicates that the Call back feature prompts the requesting device to go off-hook to invoke a callback when the target device becomes free. This event indicates the prompting.

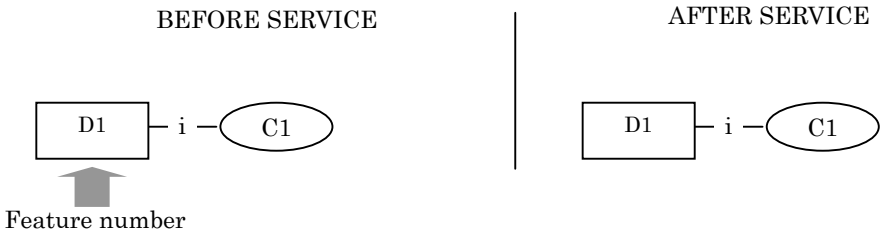
Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.callbackNotification

Parameter Name	Type	M/C/O	Description
callBackID	OCTET STRING (SIZE(0..4))	M	Cross ReferenceID for CallBackInvoke
prompted	BOOLEAN	M	TRUE: Ringing has started FALSE: Ringing has stopped
requestingDevice	DeviceID	M	RequestingDevice
targetDevice	SubjectDeviceID	O	TargetDevice (Provided extension only)

16.2.2. KmeDigitsReport

This event notifies a manual digit entry on the phone with characters (character-string) on initiated state connection. Entering a feature number is needed to activate this feature. This event continues until the call is cleared.
Note : Size of digits is always one in current implementation.



Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.digitsReport

Parameter Name	Type	M/C/O	Description
connection	ConnectionID	M	Subject connection
digits	IA5String(SIZE(0..64))	M	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, A, B, C, D, * and #

TDA/TDE Implementation

1. Feature number to generate this event should be assigned using TDA/TDE Maintenance Console application.
   Location of feature number setting : System - Numbering Plan - Feature No.72 Dial Information(CTI)

16.2.3. KmeCheckedIn

This is one of room status control feature (PBX hospitality features).
This event notifies a guest room status is changed to check-in.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeHotelControl.checkedIn

Parameter Name	Type	M/C /O	Description
checkedIn	DeviceID	M	Extension number of a guest room which room status is changed to check-in.

16.2.4. KmeCheckedOut

This is one of room status control feature (PBX hospitality features).
This event notifies a guest room status is changed to check-out.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeHotelControl.checkedOut

Parameter Name	Type	M/C /O	Description
checkedOut	DeviceID	M	Extension number of a guest room which room status is changed to check-out.

16.2.5. KmeCleanUpNotReady

This is one of room status control feature (PBX hospitality features).
This event notifies a guest room's cleaning status is changed to NotReady (=need clearing).

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeHotelControl.cleanUpNotReady

Parameter Name	Type	M/C /O	Description
cleanUpNotReady	DeviceID	M	Extension number of a guest room which room status is changed.

16.2.6. KmeCleanUpReady

This is one of room status control feature (PBX hospitality features).
This event notifies a guest room's cleaning status is changed to Ready (cleaning is finished).

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeHotelControl.cleanUpReady

Parameter Name	Type	M/C /O	Description
cleanUpReady	DeviceID	M	Extension number of a guest room which room status is changed.

16.2.7. KmeLocalAlerm

If the system error is detected on the PBX side, an error message is provided to the administrator's extension device. This event is used to provide such information to the computing function.

Note : This event is sent on monitor for system device.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeLocalAlerm

Parameter Name	Type	M/C /O	Description
(localAlerm)	KmeLocalAlerm	M	Local alarm message

16.2.8. KmeFreeOgmPort

This event notifies that usage of OGM port (DISA device) is changed. This event contains number of free OGM ports as a parameter.
This number could be changed when execution of UCD timetable, KmeOGMStart/Stop, Data Collection service, etc.

Note : This event is sent on monitor for system device.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.freeOgmPort

Parameter Name	Type	M/C/O	Description
KmeFreeOgmPort	INTEGER	M	Number of free OGM ports.

TDA/TDE implementation

1.Data structure
KmeFreeOgmPort ::= INTEGER

16.2.9. KmeOgmStatus

This event notifies that OGM starts or ends being played. This event is only applicable to OGM requested by the computing function.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.ogmStatus

Parameter Name	Type	M/C /O	Description
connection	ConnectionID	M	Subject connection
ogmPortNumber	DeviceID	M	DeviceID(DISA) of using port.
state	ENUMERATED	M	0=Started、 1=Ended
ogmId	INTEGER	M	From 1 to 64 (max).

16.2.10. KmePDFStatus

This event notifies that Physical Device Feature service mode is started(=CTI Control Mode) or terminated(=Normal Mode).

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.pDFStatus

Parameter Name	Type	M/C /O	Description
targetDevice	DeviceID	M	DeviceID(Extension) whose PDF service mode has changed.
originatingDevice	DeviceID		DeviceID which requested PDF service mode of target device.
status	BOOLEAN	M	TRUE=Started, FALSE=Stopped

TDA/TDE Implementation

1. CTI Control Mode Start/Stop

Start	If KmePDFStart is requested from PC:
Stop	If KmePDFStop is requested from PC, call arrives to PC or call is made from PS:

2. Value of originatingDevice

Requested Device	Value of originatingDevice
An extension requested	Extension number
3rd Party I/F requested	0x03000000
targetDevice goes out of CS area	0x02000000

16.2.11. KmeSystemDataChanged

S -> C

The KmeSystemDataChanged event notifies that system data has changed.
Note : This event is sent on monitor for system device.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeSystemData.systemDataChanged

System Data

Parameter Name	Type	M/C/O	Description
systemData	ENUMERATED	M	Specifies one of the following: featureList — List of Feature number speedDial — System speed dial trunkGroup — Trunk group information extensionGroup — Extension group information pickupGroup — Pickup group information pagingGroup — Paging group information incomingGroup — Incoming group information dayNightMode — Day/Night modes doorPhone — Door Phone information vmGroup — Voice Mail group information systemTime — System time psGroup — PS(Wireless) group information trunkGMember — Trunk group member information incomingGMember — Incoming group member information psGMember — PS group member information vmGMember — VM group member information broadcastGMembers — Broadcast group member information subdomainName — Name of the PBX externalSensor — External Sensor Name svm

Device Data

Parameter Name	Type	M/C/O	Description
device	DeviceID	M	
sysData	ENUMERATED	M	Specifies one of the following: wakeUp — Timed Reminder information remoteStatationLock — remoteStationLock callLogLock — callLogLock absentMessage — absentMessage forwardDnd — Forward/DND information cos — Extension Class Of Service extName — Extension name assocExtGroup — Joning extension group fcoKey — Fco Key Information sxdpMaster — Master PT is changed

deviceBasicInfo

Parameter Name	Type	M/C/O	Description
deviceBasicInfo	DeviceID	M	Extension number is changed. DeviceID is DeviceNumber Type.

reconfiguration

Parameter Name	Type	M/C/O	Description
reconfiguration	NULL	M	This event is generated when: a. The PBX cannot determine what system data was changed (includes TDA/TDE maintenance console operation). b. Status of a lot of devices are changed at the same time.

16.2.12. KmeSystemDataRevision

This event notifies which system data revision information for certain categories.

Note : This event is sent just after GetSystemDataRsp when computing function issues GetSystemDataReq.timeStamp.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeSystemData.systemDataRevisionRecord

Parameter Name	Type	M/C/O	Description
systemDataRevisionRecord	OCTET STRING (SIZE(0..128))	M	Information containing updated system data of following categories. featureList, trunkGroup, extensionGroup, pickupGroup, pagingGroup, incomingGroup, vmGroup, trkGMember, ExtGMember, incomGMember, vmGMember, speedDial

16.2.13. KmeSystemDataStatus

This event indicates that the system data is locked/unlocked.

Note : This event is sent on monitor for system device.

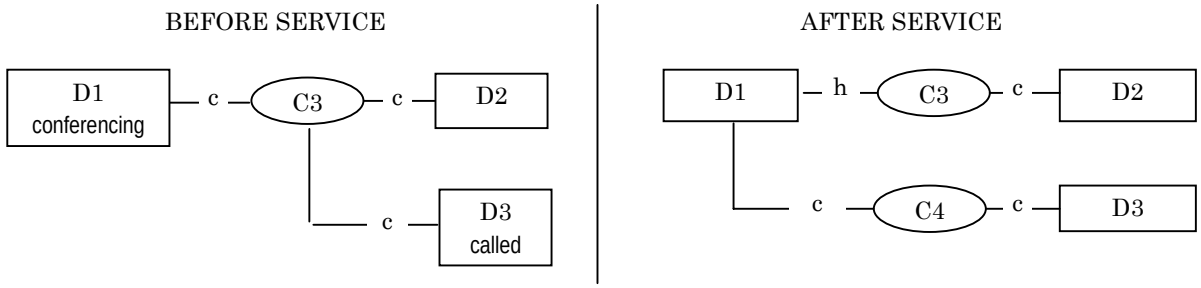
Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmeSystemData.`systemDataStatus`

Parameter Name	Type	M/C/O	Description
systemDataLock	BOOLEAN	M	true:lock, false:unlock
lockingDevice	DeviceID	O	DeviceID of locking device. This is not provided for unlocking.

16.2.14. KmeUnconferenced

This event is issued when an originator of a conference call presses TRANSFER button. As a result, the conference call return to pre-conference state. CallID of the conference call is turned over into one of resulting calls which depends on prehistory.



Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.unconferenced

Parameter Name	Type	M/C /O	Description
unconferencingDevice	DeviceID	M	Originator of conference call
primaryCall	ConnectionID	M	Specifies held connection at the monitored device.
secodaryCall	ConnectionID	O	Specifies connected connection at the monitored device.
primaryNID	DeviceID	O	Specifies dialling digits associated with primaryCall. This parameter is provided only for external calls.
secondaryNID	DeviceID	O	Specifies dialling digits associated with secodaryCall This parameter is provided only for external calls.
primaryConnectionInfo	LocalConnectionState	M	Specifies the local connection state of the device associated with primaryCall.
secondaryConnectionInfo	LocalConnectionState	O	Specifies the local connection state of the device associated with secodaryCall.

16.2.15. KmeWakeupResult

The KmeWakeupResult event notifies the Wake Up call answer status.

Event Parameters

[OPERATION]
PrivateEvent.privateData.private.kmePrivateEvent.wakeupResult

Parameter Name	Type	M/C /O	Description
device	DeviceID	M	Target device
state	KmeWakeupState	M	enumerated{answered (0),noAnswer (1)}
wakeupTime	KmeWakeUpTime	M	Scheduled time
invokeTime	GeneralizedTime	M	Answered time or the time of re-try timeout
restOfRetry	INTEGER	O	Rest of re-try

Annex A : Service Limitation according to Device Category

Services & Events	Station				VU	NI	Grp	RD	PSG
	PT	SLT	ISDN	PS					
Monitoring Services									
Monitor Start	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monitor Stop	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Snapshot Service									
Snapshot Device	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Snapshot Device Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Call Control Service									
Alternate Call	Yes	Yes	No	No	No	No	No	No	No
Answer Call	Yes	No	No	No	No	No	No	Yes	No
Call Back Call-Related	Yes	Yes	No	No	No	No	No	No	No
Call Back Message Call-Related	Yes	Yes	No	No	No	No	No	No	No
Clear Connection	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Conference Call	Yes	Yes	No	No	No	No	No	No	No
Consultation Call	Yes	Yes	No	No	No	No	No	No	No
Deflect Call	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
Dial Digits	Yes	Yes	No	No	No	No	No	No	No
Directed Pickup Call	Yes	Yes	No	No	No	No	No	No	No
Hold Call	Yes	Yes	No	No	No	No	No	No	No
Intrude Call	Yes	Yes	No	No	No	No	No	No	No
Make Call	Yes	Yes	No	No	No	No	No	No	No
Park Call	Yes	Yes	No	No	No	No	No	No	No
Retrieve Call	Yes	Yes	No	No	No	No	No	No	No
Transfer Call	Yes	Yes	No	No	No	No	No	No	No
Call Control Event									
Conferenced	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Connection Cleared	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delivered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diverted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Established	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Failed	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Held	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Network Reached	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Originated	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Queued	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Retrieved	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Service Initiated	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Transferred	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Call Associated Feature Services									
Generate Digits	No	No	No	No	No	Yes	No	No	No
Genarate Telephony Tones	Yes	Yes	Yes	Yes	No	Yes	No	No	No
Call Associated Feature Events									
Call Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service Completion Failure	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No

VU .... Voice Unit
NI .... Network Interface
Grp ... Group(Incoming Group)
RD .... Routeing Device
PSG... PS Group

* ACD(CTI) mode only

Services & Events	Station				VU	NI	Grp	RD	PSG
	PT	SLT	ISDN	PS					
Physical Device Features Services									
Button Press	Yes	No	No	No	No	No	No	No	No
Get Message Waiting Indicator	Yes	Yes		Yes					
Get Microphone Mute	Yes								
Get Speaker Volume	Yes								
Set Display	Yes	No	No	Yes	No	No	No	No	No
Set Lamp Mode	Yes								
Set Microphone Mute	Yes								
Set Ringer Status	Yes			Yes					
Set Speaker Volume	Yes								
Physical Device Features Events									
Button Press	Yes	No	No	Yes	No	No	No	No	No
Message Waiting	Yes			Yes					
Microphone Mute	Yes								
Ringer Status	Yes	Yes	Yes	Yes					
Speaker Volume	Yes								
Logical Device Features Service									
Call Back Message Non-Call-Related	Yes	Yes	Yes	Yes	No	No	No	No	No
Cancel Call Back	Yes	Yes	No	No	No	No	No	No	No
Cancel Call Back Message	Yes	Yes	Yes	Yes	No	No	No	No	No
Get Agent State	Yes	Yes	Yes	Yes	No	No	No	No	No
Get Auto Answer	Yes	Yes	Yes	Yes	No	No	No	No	No
Get Auto Work Mode	Yes	Yes	Yes	Yes	No	No	No	No	No
Get Forwarding	Yes	Yes	Yes	Yes	No	No	No	No	No
Set Agent State	Yes	Yes	Yes	Yes	No	No	No	No	No
Set Auto Answer	Yes	Yes	Yes	Yes	No	No	No	No	No
Set Auto Work Mode	Yes	Yes	Yes	Yes	No	No	No	No	No
Set CallerID Status	Yes	Yes	Yes	Yes	No	No	No	No	No
Set Forwarding	Yes	Yes	Yes	Yes	No	No	No	No	No
Logical Device Features Events									
Agent Busy	Yes	Yes	Yes	Yes	No	No	No	No	No
Agent Logged Off	Yes	Yes	Yes	Yes	No	No	No	No	No
Agent Logged On	Yes	Yes	Yes	Yes	No	No	No	No	No
Agent Not Ready	Yes	Yes	Yes	Yes	No	No	No	No	No
Agent Ready	Yes	Yes	Yes	Yes	No	No	No	No	No
Agent Working After Call	Yes	Yes	Yes	Yes	No	No	No	No	No
Auto Answer	Yes	Yes	Yes	Yes	No	No	No	No	No
Auto Work Mode	Yes	Yes	Yes	Yes	No	No	No	No	No
Call Back	Yes	Yes	Yes	Yes	No	No	No	No	No
Call Back Message	Yes	Yes	Yes	Yes	No	No	No	No	No
Forwarding	Yes	Yes	Yes	Yes	No	No	No	No	No
Device Maintenance Events									
Back Service	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Out Of Service	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Data Collection Services									
Data Collected	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Start Data Collection	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Stop Data Collection	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Call Detail Record(CDR) Services									
Call Detail Records Report	-	-	-	-	-	-	-	-	-
Start Call Detail Records Transmission	-	-	-	-	-	-	-	-	-
Stop Call Detail Records Transmission	-	-	-	-	-	-	-	-	-
Vender Specific Extensions Services									
Escape	Yes	Yes	Yes	Yes	No	No	No	No	No
Vender Specific Extensions Events									
Private Event	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Services & Events	VMG	DP	DISA	Pk	PgG	ExPg	ExSn	ExRg	Mdm	Hd
Monitoring Services										
Monitor Start	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monitor Stop	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Snapshot Service										
Snapshot Device	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Snapshot Device Data	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Call Control Service										
Alternate Call	No	No	No	No	No	No	No	No	No	No
Answer Call	No	No	No	No	No	No	No	No	No	No
Call Back Call-Related	No	No	No	No	No	No	No	No	No	No
Call Back Message Call-Related	No	No	No	No	No	No	No	No	No	No
Clear Connection	No	No	No	No	No	No	No	No	No	No
Conference Call	No	No	No	No	No	No	No	No	No	No
Consultation Call	No	No	No	No	No	No	No	No	No	No
Deflect Call	No	No	No	No	No	No	No	No	No	No
Dial Digits	No	No	No	No	No	No	No	No	No	No
Directed Pickup Call	No	No	No	No	No	No	No	No	No	No
Hold Call	No	No	No	No	No	No	No	No	No	No
Intrude Call	No	No	No	No	No	No	No	No	No	No
Make Call	No	No	No	No	No	No	No	No	No	No
Park Call	No	No	No	No	No	No	No	No	No	No
Retrieve Call	No	No	No	No	No	No	No	No	No	No
Transfer Call	No	No	No	No	No	No	No	No	No	No
Call Control Event										
Conferenced	No	No	No	No	No	No	No	No	No	No
Connection Cleared	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delivered	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Diverted	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Established	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
Failed	No	Yes	Yes	No	No	No	No	No	No	No
Held	No	No	Yes	No	No	No	No	No	No	No
Network Reached	No	Yes	Yes	No	No	No	No	No	No	Yes
Originated	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
Queued	No	No	No	Yes	No	No	No	No	No	No
Retrieved	No	No	No	No	No	No	No	No	No	No
Service Initiated	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes
Transferred	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Call Associated Feature Services										
Generate Digits	No	No	No	No	No	No	No	No	No	No
Genarate Telephony Tones	No	No	No	No	No	No	No	No	No	No
Call Associated Feature Events										
Call Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service Completion Failure	No	No	No	No	No	No	No	No	No	No

VMG .... Voice Mail Group
DP ... Door Phone
Pk ... Park
PgG ... Paging Group
ExPg ... External Pager
ExSn ... External Sensor
ExRg ... External Ringer
Mdm ... Modem
Hd ... Hdlc

Services & Events	VMG	DP	DISA	Pk	PgG	ExPg	ExSn	ExRg	Mdm	Hd
Physical Device Features Services										
Set Display	No	No	No	No	No	No	No	No	No	No
Physical Device Features Events										
Button Press	No	No	No	No	No	No	No	No	No	No
Logical Device Features Service										
Call Back Message Non-Call-Related	No	No	No	No	No	No	No	No	No	No
Cancel Call Back	No	No	No	No	No	No	No	No	No	No
Cancel Call Back Message	No	No	No	No	No	No	No	No	No	No
Get Agent State	No	No	No	No	No	No	No	No	No	No
Get Auto Answer	No	No	No	No	No	No	No	No	No	No
Get Auto Work Mode	No	No	No	No	No	No	No	No	No	No
Get Forwarding	No	No	No	No	No	No	No	No	No	No
Set Agent State	No	No	No	No	No	No	No	No	No	No
Set Auto Answer	No	No	No	No	No	No	No	No	No	No
Set Auto Work Mode	No	No	No	No	No	No	No	No	No	No
Set CallerID Status	No	No	No	No	No	No	No	No	No	No
Set Forwarding	No	No	No	No	No	No	No	No	No	No
Logical Device Features Events										
Agent Busy	No	No	No	No	No	No	No	No	No	No
Agent Logged Off	No	No	No	No	No	No	No	No	No	No
Agent Logged On	No	No	No	No	No	No	No	No	No	No
Agent Not Ready	No	No	No	No	No	No	No	No	No	No
Agent Ready	No	No	No	No	No	No	No	No	No	No
Agent Working After Call	No	No	No	No	No	No	No	No	No	No
Auto Answer	No	No	No	No	No	No	No	No	No	No
Auto Work Mode	No	No	No	No	No	No	No	No	No	No
Call Back	No	No	No	No	No	No	No	No	No	No
Call Back Message	No	No	No	No	No	No	No	No	No	No
Forwarding	No	No	No	No	No	No	No	No	No	No
Device Maintenance Events										
Back Service	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes
Out Of Service	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes
Collection Services										
Data Collected	No	No	No	No	No	No	No	No	No	No
Start Data Collection	No	No	No	No	No	No	No	No	No	No
Stop Data Collection	No	No	No	No	No	No	No	No	No	No
Call Detail Record(CDR) Services										
Call Detail Records Report	-	-	-	-	-	-	-	-	-	-
Start Call Detail Records Transmission	-	-	-	-	-	-	-	-	-	-
Stop Call Detail Records Transmission	-	-	-	-	-	-	-	-	-	-
Vender Specific Extensions Services										
Escape	No	No	No	No	No	No	No	No	No	No
Vender Specific Extensions Events										
Private Event	No	No	No	No	No	No	No	No	No	No

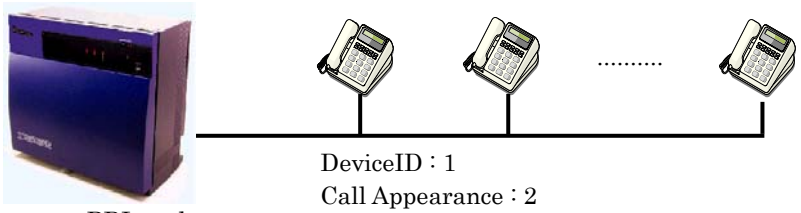
Annex B ISDN Implementation

B.1 Station (ISDN extension)

An ISDN station device has 2 or 23 or 30 B-channels as follows. But each device has one device identifier (extension number).
Maximum number of physical telephone set which can be connected to one BRI is 8.

ISDN Type	Number of B-Channels	Number of DeviceID	DeviceID Type
BRI	2	1	NumberDigits
PRI23	23	1	NumberDigits
PRI30	30	1	NumberDigits

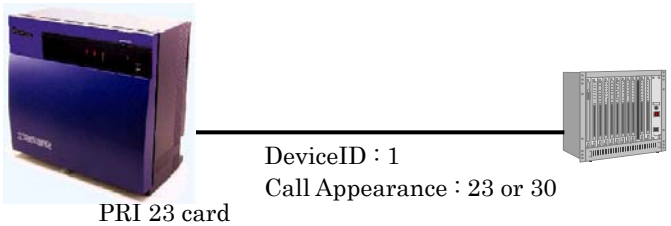
BRI



DeviceID : 1
Call Appearance : 2

BRI card

PRI



DeviceID : 1
Call Appearance : 23 or 30

PRI 23 card
PRI 30 card

Service request to an ISDN station

The computing function cannot specify each B-channel in a service request (extension number only available).

Available call control service request to ISDN extension :

ClearConnection(connectionToBeCleared.deviceID)
DeflectCall(callToBeDiverted.deviceID)

Events from ISDN station

Each B-channel is mapped into a call appearance in TDA/TDE PBX. Particular parameters has component of call appearance in device identifier according to Switching Function Representation format.
Events and parameters whose device identifier is provided in Switching Function Representation format are shown below (yellow).

Events	Connection Type	SubjectDeviceID Type	DeviceID Type	DeviceID Type
Conferenced	primaryOldCall	conferencingDevice		
	secondaryOldCall	addedParty		
ConnectionCleared	droppedConnection	releasingDevice		
Delivered	connection	alertingDevice	Calling	Called
Diverted	connection	divertingDevice	Calling	Called
		newDestination		
Established	establishedConnection	answeringDevice	Calling	Called
Failed	failedConnection	failingDevice	Calling	Called
Held	heldConnection	holdingDevice		
NetworkReached				
Originated	originatedConnection		Calling	Called
Queued	queuedConnection	queue	Calling	Called
Retrieved	retrievedConnection	retrievingDevice		
ServiceInitiated	initiatedConnection	initiatingDevice		
Transferred	primaryOldCall	transferringDevice		
	secondaryOldCall	transferredToDevice		
KmeUnconferenced	primaryCall		unconferencingDevice	
	secodaryCall			
ServiceCompletionFailure	ConnectionID in primaryCall		deviceID in primaryCall	

When a device is ISDN, device identifier in above parameters(yellow) will be like "N201&2". This means : Extension number is "201", using B-channel is 2.

Call Detail Records Report

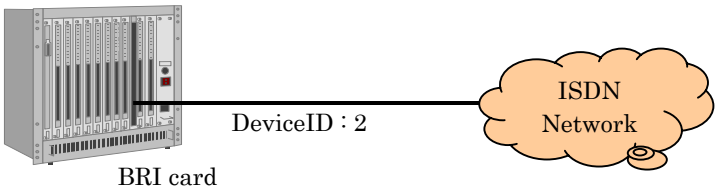
Switching Function Representation format is used for callingDevice and calledDevice.

B.2 Network Interface (ISDN CO line)

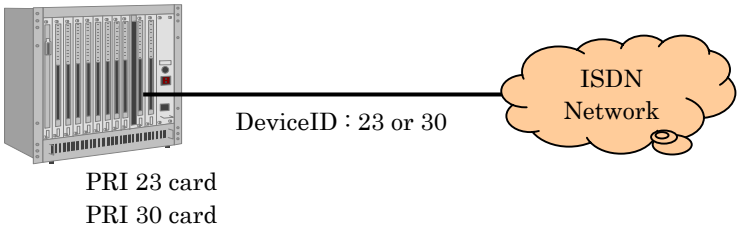
An ISDN network interface device has 2 or 23 or 30 B-channels as follows. Each channel has one device identifier.

ISDN Type	Number of B-Channels	Number of DeviceID	DeviceID Type
BRI	2	2	DeviceNumber
PRI23	23	23	DeviceNumber
PRI30	30	30	DeviceNumber

BRI



PRI



Service request to an ISDN station

Because number of B-channels and device identifier are one-one relations, the computing function can specify each B-channel by its device identifier in a service request.

Events from ISDN station

Call appearance component is not used in events. The format of device identifier is always Daillable Digits.

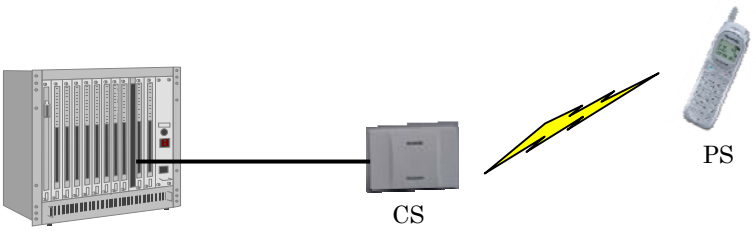
Call Detail Records Report

This is same as events.

Annex C : PS Implementation

PS is a type of station device and it has wireless communication channel. Each PS has a device identifier whose type is NumberDigits(=extension number).
Limitation of system configuration:

3(2.4GHz) or 4(DECT) PSs can be connected to a CS at the same time.
8 CSs can be connected to a CSIF8 card.
32 CSs can be connected to a TDA/TDE200 system.



Available call control service request to PS :

ClearConnection(connectionToBeCleared.deviceID)
DeflectCall(callToBeDiverted.deviceID)

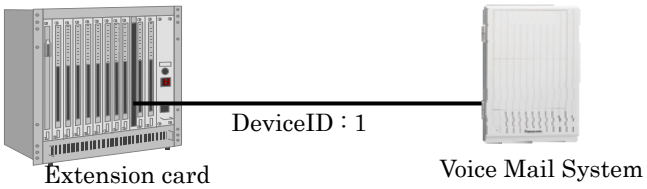
Other features :

1) PS device becomes INS when its extension number is assigned.
2) PS device shall be a member of a user group (extension group) as same as other station devices.
3) PS device can be a member of an incoming group.
4) PS device can be a member of PS paging group.

Annex D: Voice Unit

A Voice Unit device has 2 B-channels as follows. Each channel has one device identifier.
No call control service is available.
Regarding device identifier of Switching Function Representation format, refer to Annex C.1 (same as ISDN BRI station).

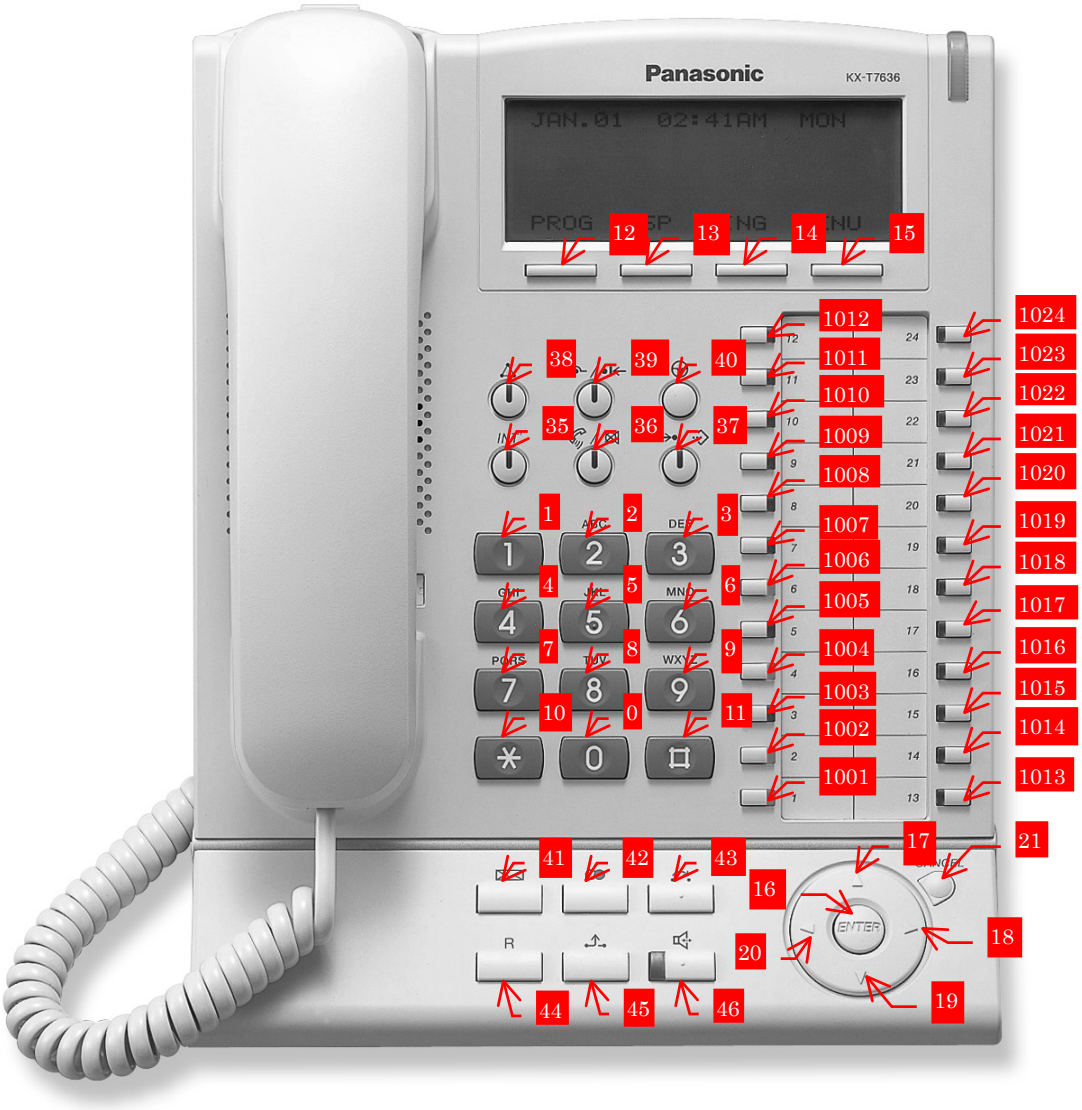
Device Category	Number of B-Channels	Number of DeviceID	DeviceID Type
Voice Unit	2	1	DeviceNumber



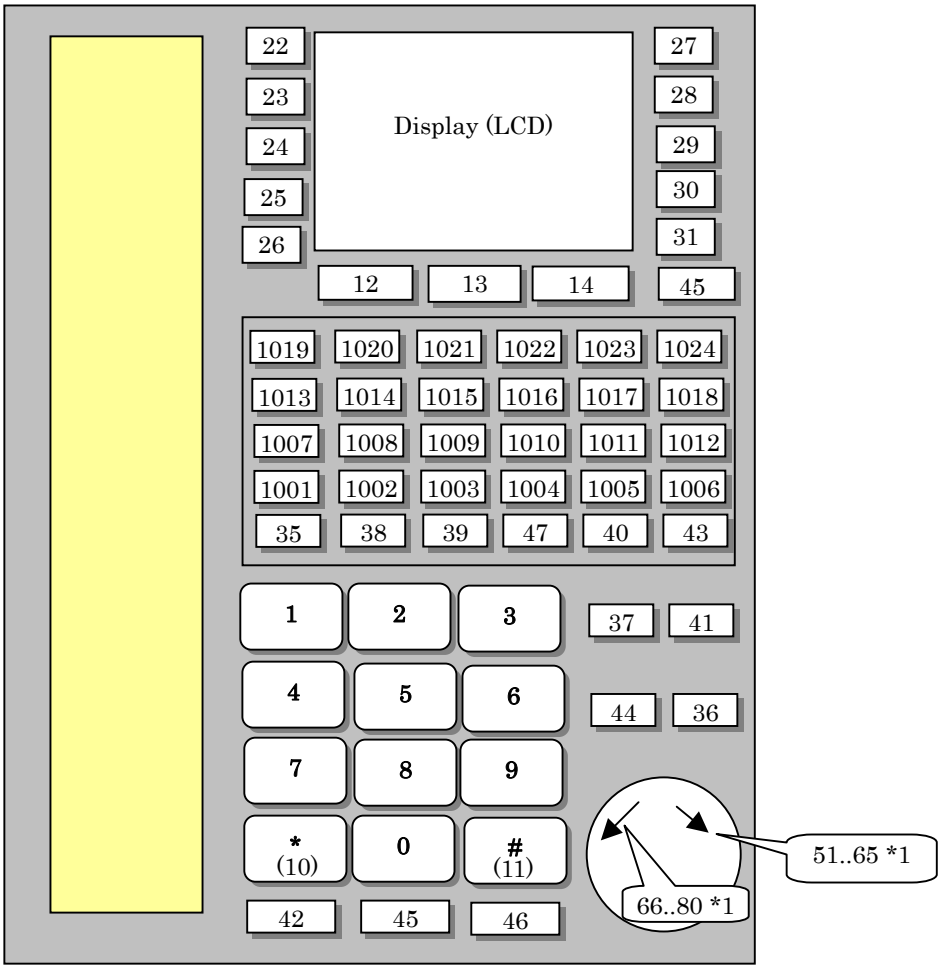
Annex E: Button Map

E.1 DPT Button ID Assign

E.1.1 KX-T76 Series



E.1.2 KX-T74, T75 Series

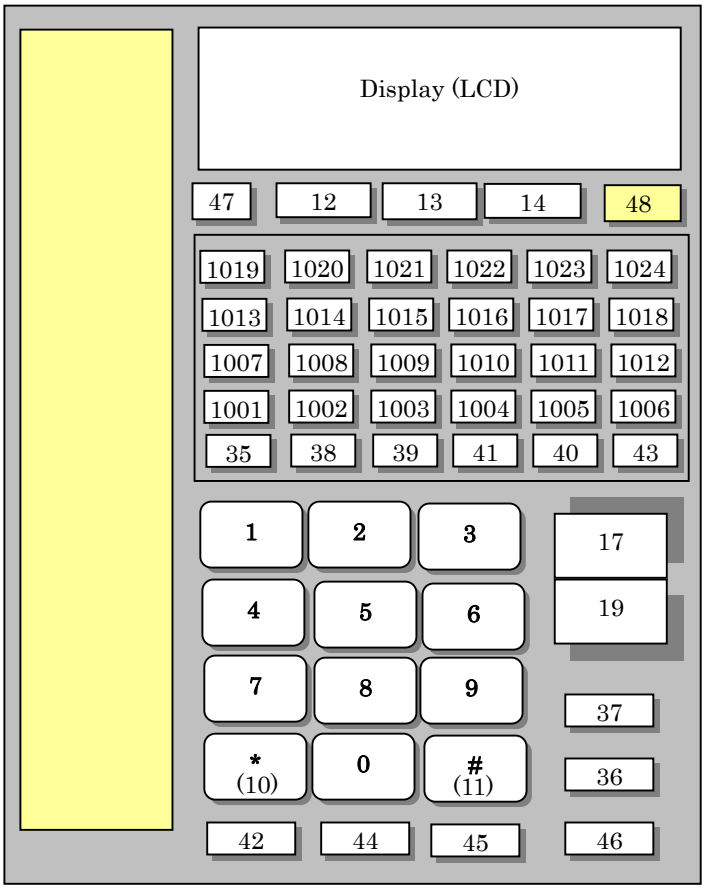


Other T7431,T7531 specific keys

Key	ButtonID	Description
MODE	49	
SELECT	50	

*1 ..... This value depends on count of rotation.

E.1.3 KX-T72 Series with Display



Following ButtonIDs are common in other type of proprietary telephone.

Key	ButtonID	Description
INTERCOM	35	
AUTO ANSWER (MUTE)	36	
AUTO DIAL (STORE)	37	
CONF	38	
FWD/DND	39	
PAUSE	40	
MESSAGE	41	
REDIAL	42	
TRANSFER	43	
FLASH/RECALL	44	
HOLD	45	
SP-PHONE	46	
PROGRAM	47	T76 series do not have this key.
SHIFT	48	T76 series do not have this key.

E.1.4 APT

Following table shows ButtonID of APT specific keys

Key	ButtonID	Description
SAVE	53	
PF1	61	
PF2	62	
PF3	63	
PF4	64	
PF5	65	
PF6	66	
PF7	67	
PF8	68	
PF9	69	
PF10	70	
PF11	71	
PF12	72	
PF13	73	
PF14	74	
PF15	75	
PF16	76	

E.1.5 DSS Console

Key	ButtonID	Description
ANSWER	51	
RELEASE	52	

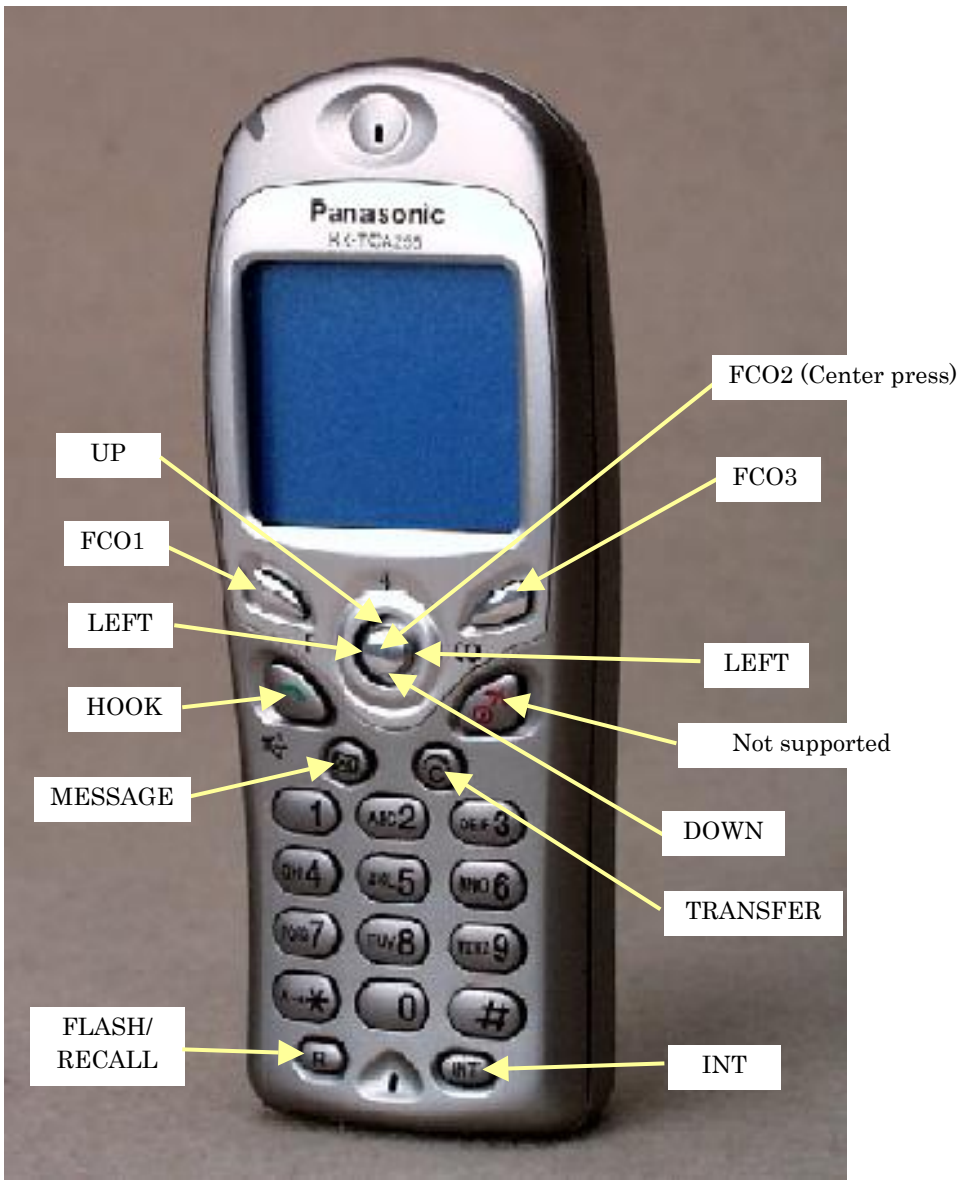
E.2 PS Button ID Assign

Following table shows ButtonID and keys which ButtonPress event is available for each type of PS.
Some of buttons are not physical button, but they are selectable from LCD menu.

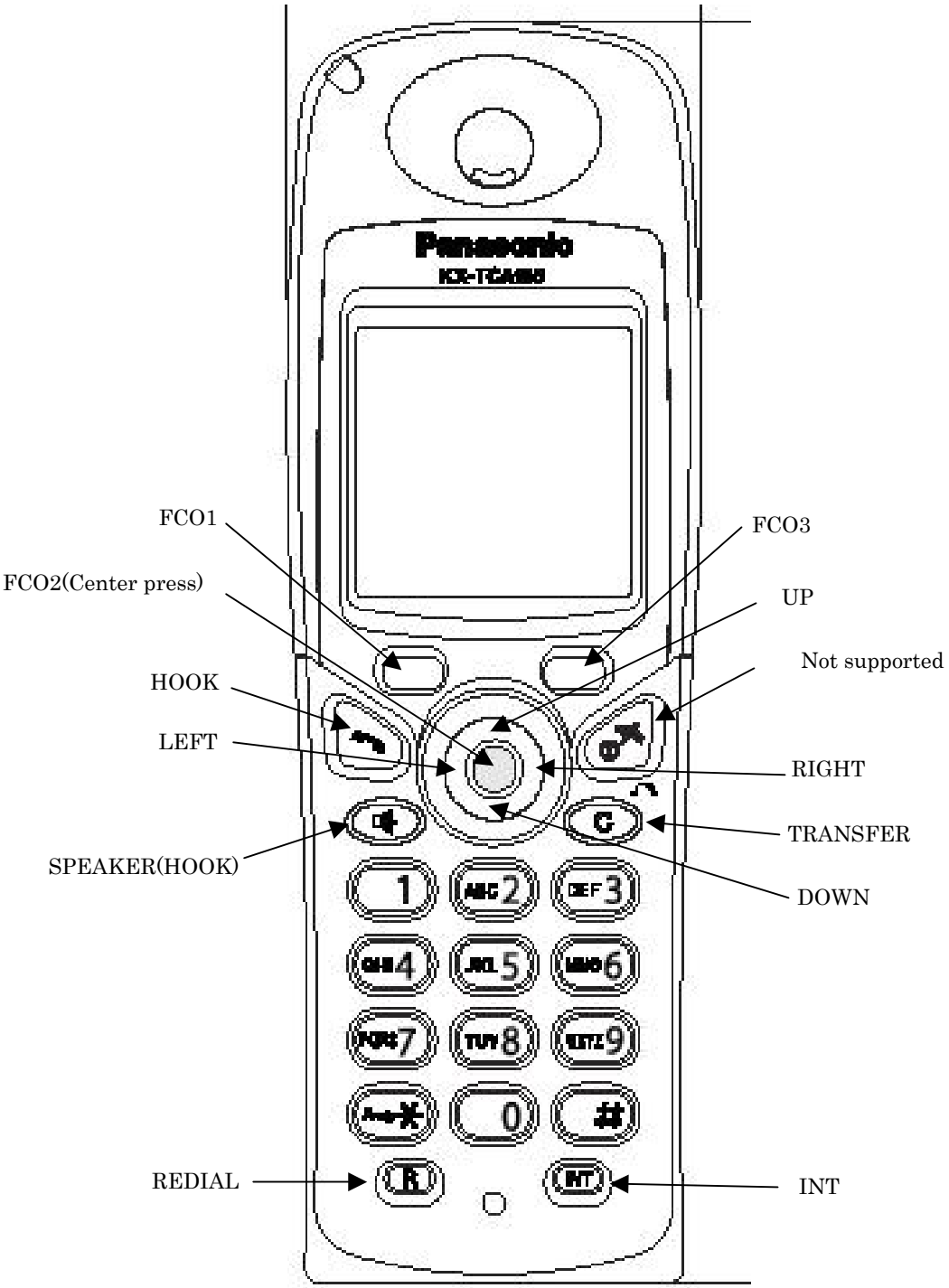
x ..... Available during PDF service mode
y ..... Available during dialing/talking
z ..... Available during programming

Key Name	Key Code PS<->PBX (Hex)	CSTA ButtonID (Dec)	DECT			2.4G	
			TCA255	TCA155	TD7590	TD7690	TD7680
Dial 0	30	0	x y z	x y z	x y z	x y z	x y z
Dial 1	31	1	x y z	x y z	x y z	x y z	x y z
Dial 2	32	2	x y z	x y z	x y z	x y z	x y z
Dial 3	33	3	x y z	x y z	x y z	x y z	x y z
Dial 4	34	4	x y z	x y z	x y z	x y z	x y z
Dial 5	35	5	x y z	x y z	x y z	x y z	x y z
Dial 6	36	6	x y z	x y z	x y z	x y z	x y z
Dial 7	37	7	x y z	x y z	x y z	x y z	x y z
Dial 8	38	8	x y z	x y z	x y z	x y z	x y z
Dial 9	39	9	x y z	x y z	x y z	x y z	x y z
Dial *	2A	10	x y z	x y z	x y z	x y z	x y z
Dial #	23	11	x y z	x y z	x y z	x y z	x y z
PAUSE	05		y z	y z	y z	y z	y
FLASH/RECALL	15	44	y z	y z	y z	y z	y z
Go To DTMF	16						
INT	17	35	x y z	x y z	x y z	y z	y z
TRANSFER	A0	43	x y	x y z	x y z	y z	x y z
REDIAL	A1	42	y	y	z	y	y
AUTO ANSWER	A2						
PROGRAM	A4						
CONF	B0			y	y z	y z	y z
HOLD	B1		y	y	y z	y z	y
FWD/DND	B3		z	y z	y	y z	y z
AUTO	B4	37	z	z	x y z	z	z
MESSAGE	B6	41	y z	y z	y z	y z	y z
F1(FCO1)	C0	101	y z	y z	y z	y z	y z
F2(FCO2)	C1	102	y z	y z	y z	y z	y z
F3(FCO3)	C2	103	y z	y z	y z	y z	y z
F4(FCO4)	C3		y z	y z	y z	y z	y z
F5(FCO5)	C4		y z	y z	y z	y z	y z
HOOK	CD	46					
UP	E0	17	x z	x z	x	x z	x z
DOWN	E1	19	x z	x z	x	x z	x z
LEFT	E2	20	x	x		x z	x z
RIGHT	E3	18	x	x		x z	x z

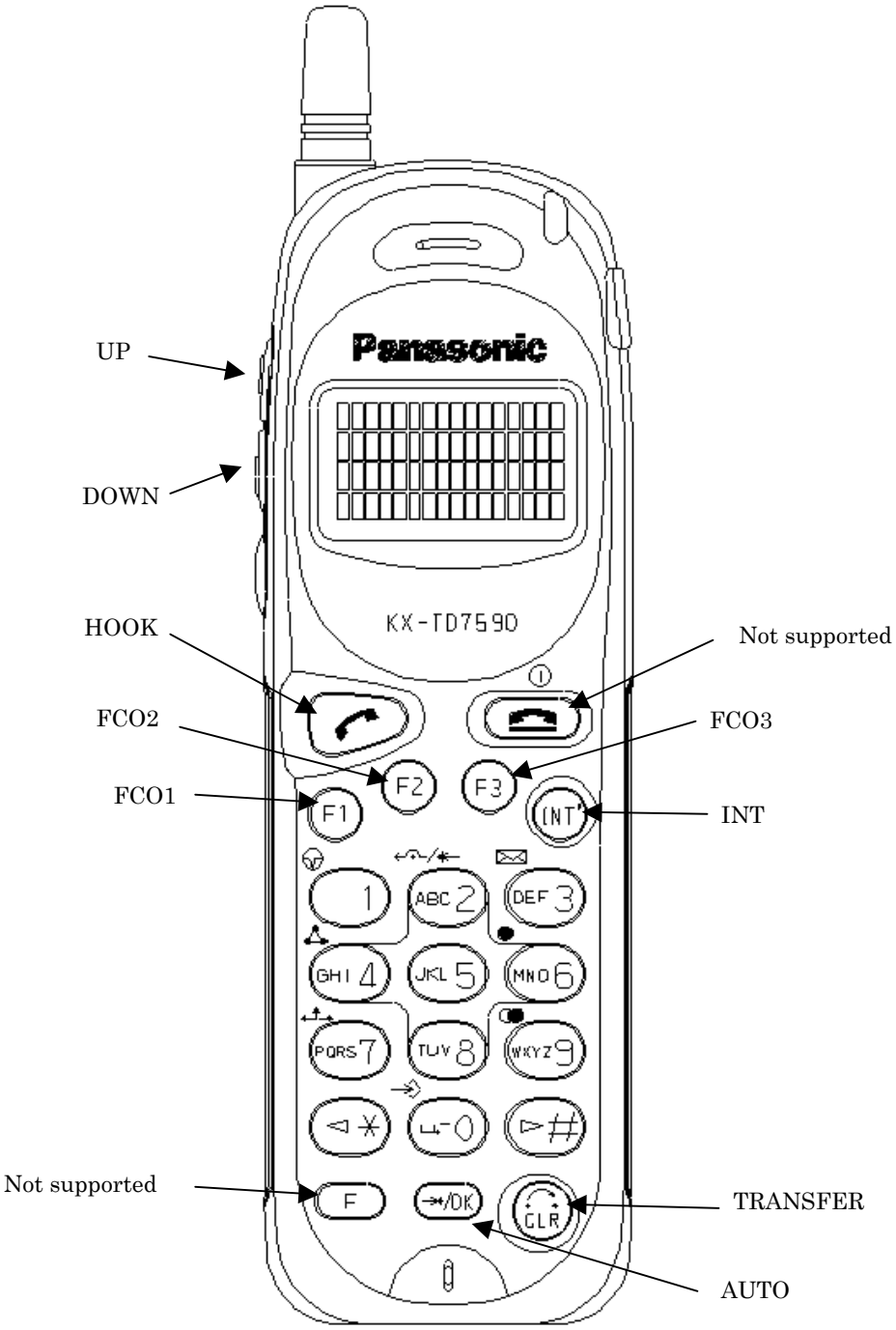
E.2.1 TCA255 (DECT)



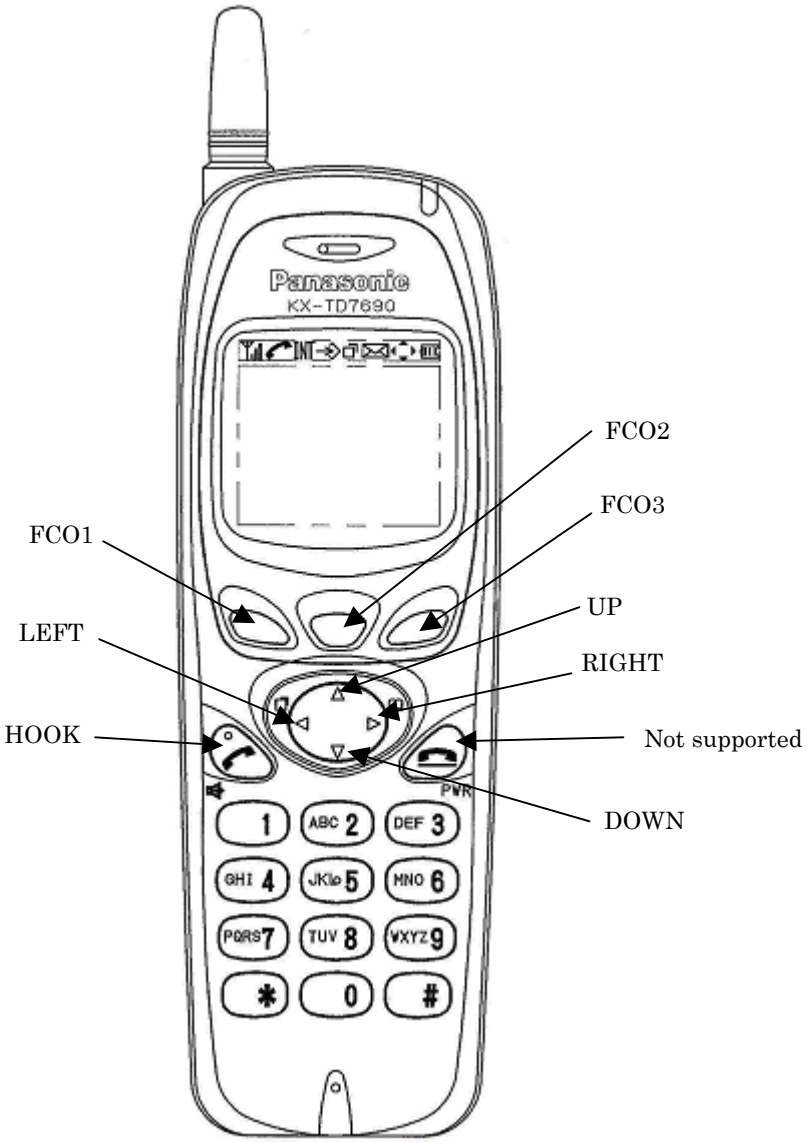
E.2.2 TCA155 (DECT)



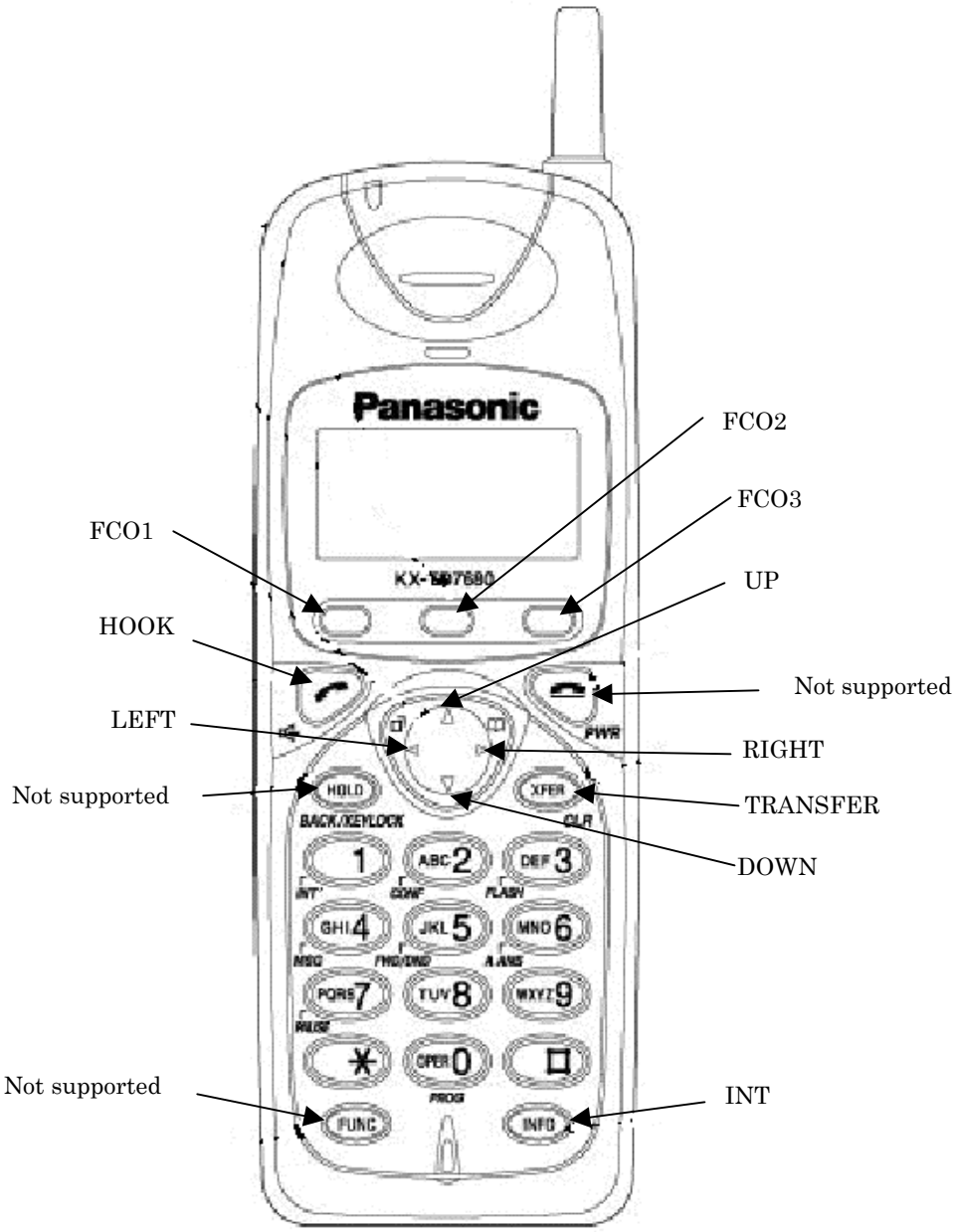
E.2.3 TD7590 (DECT)



E.2.4 TD7690 (2.4G)



E.2.5 TD7680 (2.4G)



Annex F: Phone Code

0x01000000	SLT
0x02000001	APT KX-T7020/7320/7720
0x02000003	APT KX-T123220
0x02020001	APT KX-T7030/7033/7330/7730
0x02020002	APT KX-T123235/T7130
0x02020003	APT KX-T123230/TD7895/T7885
0x02020005	APT KX-T7735
0x02030001	APT KX-T7030/7033/7330/7730
0x02030002	APT KX-T123235/T7130
0x02030003	APT KX-T123230
0x02030005	APT KX-T7735
0x02040001	APT KX-T7050/7350/7750
0x02040003	APT KX-T123250
0x02080003	APT KX-T61620
0x02090003	APT KX-T61650
0x020a0003	APT KX-T61630/31
0x020b0003	APT KX-T61630/31
0x020c0003	APT KX-T30820/25
0x020d0000	APT KX-T30850/T7055
0x020d0003	APT KX-T7894 (Wireless)
0x020e0003	APT KX-T30830
0x020f0003	APT KX-T30830
0x03000000	Old DPT KX-T7235
0x03000001	Old DPT KX-T7x36
0x03000002	Old DPT KX-T7536
0x03000012	Old DPT KX-T7536+12CO
0x03000801	Old DPT KX-T7436
0x03000802	Old DPT KX-T7536
0x03000812	Old DPT KX-T7536+12CO
0x03010000	Old DPT KX-T7230
0x03010001	Old DPT KX-T7433
0x03010002	Old DPT KX-T7533
0x03010003	Old DPT KX-T7431
0x03010004	Old DPT KX-T7531
0x03010012	Old DPT KX-T7533+12CO
0x03010014	Old DPT KX-T7531+12CO
0x03010801	Old DPT KX-T7433
0x03010802	Old DPT KX-T7533
0x03010803	Old DPT KX-T7431
0x03010804	Old DPT KX-T7531/7565
0x03010812	Old DPT KX-T7533+12CO
0x03010814	Old DPT KX-T7531+12CO
0x03018804	Old DPT KX-T7565
0x03040000	Old DPT KX-T7250
0x03040001	Old DPT KX-T7420
0x03040002	Old DPT KX-T7450
0x03040003	Old DPT KX-T7520
0x03040004	Old DPT KX-T7550/7560
0x03040013	Old DPT KX-T7520+12CO
0x03040014	Old DPT KX-T7550+12CO
0x03040801	Old DPT KX-T7420
0x03040802	Old DPT KX-T7450
0x03040803	Old DPT KX-T7520
0x03040804	Old DPT KX-T7550
0x03040813	Old DPT KX-T7520+12CO
0x03040814	Old DPT KX-T7550+12CO
0x03048004	Old DPT KX-T7560
0x03050000	Old DPT KX-T7220/7451
0x03050001	Old DPT KX-T7425
0x03050801	Old DPT KX-T7425
0x05000000	Old DSSConsole KX-T123240
0x05040000	Old DSSConsole KX-T61640
0x06000001	New DSSConsole KX-T7440
0x06000002	New DSSConsole KX-T7441
0x06000005	New DSSConsole KX-T7540
0x06000006	New DSSConsole KX-T7541
0x06050001	New DSSConsole KX-T7640
0x07100000	Old format VPS (PCC)

0x07100001	Old format VPS (TVS75)
0x07100002	Old format VPS (TVS100)
0x07200000	New format VPS (PCC)
0x08100000	New DPT KX-T7625
0x08100001	New DPT KX-T7630
0x08100002	New DPT KX-T7633
0x08100012	New DPT KX-T7633+12CO
0x08100022	New DPT KX-T7633+USB
0x08100032	New DPT KX-T7633+12CO+USB
0x08100003	New DPT KX-T7636
0x08100013	New DPT KX-T7636+12CO
0x08100023	New DPT KX-T7636+USB
0x08100033	New DPT KX-T7636+12CO+USB
0x08100004	New DPT KX-T7665
0x09100003	IP-PT KX-NT136
0x09100004	IP-PT KX-NT265
0x09100005	IP-PT KX-NT265 Multi
0x09100006	IP-PT KX-NT343
0x09100007	IP-PT KX-NT346
0x09100008	IP-PT KX-NT366
0x0a000000	071:PS KX-TD7500CE(for TD PBX)
0x0a000001	072:PS KX-TD7590CE(for TD PBX)
0x0a000010	073:PS KX-TD7690(2.4G SS: for TDA PBX)
0x0a000020	074:PS KX-TD7590CE(DECT:for TDA PBX)
0x0a000080	075:PS Other Manufacturer
0x0a000081	075:PS KX-TCD706:ISDN compliant PS)
0x0a000082	075:PS KX-TCD706:ISDN compliant PS(with data))
0x0a000083	075:PS KX-TCD7580
0x0e000001	ISDN
0x0e000002	OPX
0x0fffffff,	Not registered

Annex G: Parameter Constraints

Parameter	Maximum Value
PDU length includes header	240
InvokeID (ROSE)	32767
DeviceID (MakeCall, DialDigits, ConsultationCall)	32
DeviceID from TDA/TDE (In events)	16
charactersToSend (GenerateDigits)	64

Annex H: Flexible Key Function List

function	Function Name
0x00	Not stored key
0x02	ICD Group(GDN)
0x03	Single-CO
0x04	Group-CO
0x05	Loop-CO
0x11	DSS
0x10	Onetouch Dial
0x13	Save
0x14	Redial
0x20	Fwd/DND (Both)
0x21	Fwd/DND (External)
0x22	Fwd/DND (Internal)
0x23	Group Fwd/DND (Both)
0x24	Group Fwd/DND (External)
0x25	Group Fwd/DND (Internal)
0x26	TRS Level Change
0x30	Conference
0x31	Hold&Paging
0x32	Call Park
0x33	Park&Paging
0x40	Answer
0x42	Release
0x43	Terminate
0x44	EFA
0x50	ISDN Service
0x51	ISDN-Hold
0x60	Voice Mail Transfer
0x61	Two Way Record
0x62	Two Way Transfer
0x63	Live Call Screen(LCS)
0x70	Wake Up Alert
0x71	Wake Up Set
0x72	Check In
0x73	Check Out
0x74	Clean Up
0x80	Message Waiting
0x81	Account
0x82	Emergency Paging
0x83	Queue Redirection
0x91	Log-in/Log-out
0x92	Wrap Up
0x93	CLIR
0x94	COLR
0x95	Headset
0x96	Time Service
0xa0	Call Log
0xa1	Charge
0xa2	System Alarm
0x87	CTI

Annex I : Software Upgrade Related Services & Events

Following table shows optional features. These functionalities are limited on normal TDA/TDE system. SD Memory Card for Software Upgrade to Enhanced Version or Activation Key for Software Upgrade to Enhanced Version is needed to make enable these services & events.

PBX	Required SD Card or Activation Key
KX-TDA30	KX-TDA3920
KX-TDA50	KX-TDA5920
KX-TDA100/200	KX-TDA0920
KX-TDA600	KX-TDA6920
KX-TDE100/200	KX-NCS6201

CSTA Standard Services & Events

Services & Events		PT	PS
Call Control Service			
	Deflect Call	No	No
Call Control Event			
	Delivered	No	No
Physical Device Feature Services			
	Button Press	Yes	N/A
	Get Message Waiting Indicator	Yes	Yes
	Get Microphone Mute	Yes	N/A
	Get Speaker Volume	Yes	N/A
	Set Display	No	Yes
	Set Lamp Mode	Yes	N/A
	Set Microphone Mute	Yes	N/A
	Set Ringer Status	Yes	Yes
	Set Speaker Volume	Yes	N/A
Physical Device Feature Events			
	Button Press	No	No
	Message Waiting	No	No
	Speaker Mute	No	N/A
	Speaker Volume	No	N/A

PCC proprietary Services & Events

Services & Events		PT	PS
Vender Specific Extensions Service			
	Kme PDF Start	N/A	Yes
	Kme PDF Stop	N/A	Yes
	Kme Get System Data KmeSystemDataLinkedReply (,subdomainName,pbxType,fcoKey,sxdpMaster,extSencer)	No	No
	Kme Set System Data (fcoKey,subdomainName)	No	No
	Kme Get System Status Revision	No	No
Vender Specific Extensions Event			
	Kme PDF Status	N/A	Yes
	Kme System Data Changed (speedDial,subdomainName,fcoKey,sxdpMaster,extSencer)	No	No
	Kme System Status Revision	No	No

Yes : SD Card for Upgrade is needed.
No : SD Card for Upgrade is not needed.

Annex X : How to Get/Set station device information

X.1 Get list of device identifier

KmeGetSystemDataReq.deviceList.category.standardDevice.station

[Return] DeviceID(NumberDigits and DeviceNumber) and status(INS or OUS)

X.2 Get port type for each station device

KmeGetSystemDataReq.deviceData.sysData.phoneProperty with deviceID obtained in X.1.

[Return]

```
KmePhoneProperty ::= SEQUENCE
{       portType            INTEGER,
        phoneCode           INTEGER,
        lcdRows             INTEGER,
        lcdColumns          INTEGER,
        numberOfCoKeys      INTEGER,
        numberOfSoftKeys    INTEGER,
        spPhone             BOOLEAN}

         Port Type
            none            0
            slt             1
            apt             2
            dptOld          3
            dpt             4
            isdn            8
            wireless        10
            ip-pt(NonP2P)   12
            ip-pt(P2P)      13
            sip             14
```

X.3 Get number of B-channel

Step1 : Get group number of extension group.

KmeGetSystemDataReq.extensionGroup

[Return]

```
KmeExtTrkGroupList ::= SEQUENCE OF SEQUENCE
{       groupNo         [0] INTEGER,
        name            [1] CHOICE
        {       single          [0] OCTET STRING(SIZE(1..20)),
                wide            [1] OCTET STRING(SIZE(1..40)) }    OPTIONAL,
        tenantNo        [2] INTEGER    OPTIONAL }
```

Step 2 : Get member information of each extensnion group.

KmeGetSystemDataReq.trkExtGMember.groupType = extGMembers with groupNo obtained in step 1.

[Return]

```
KmeExtGroupEntry ::= SEQUENCE
{       device          [0] DeviceID,   -- ext. number
        name            [1] CHOICE
        {       single          [0] OCTET STRING(SIZE(1..20)),
                wide            [1] OCTET STRING(SIZE(1..40)) }    OPTIONAL,
        devNumber       [2] DeviceID,   -- device number
        cabinetNO       [3] INTEGER                             OPTIONAL,
        psNo            [4] IA5String(SIZE(1..3))               OPTIONAL,
        numberOfBch     [5] INTEGER                             OPTIONAL}
```

X.4 System time

X.4.1 Get System Time

KmeGetSystemDataReq.systemData.systemTime

[Return] `GeneralizedTime`

X.4.1 Set System Time

KmeSetSystemData.systemData.time [`GeneralizedTime`]

X.5 COS

X.5.1 Get cos information

KmeGetSystemDataReq.deviceData.sysData.cos with deviceID

[Return] `INTEGER`

X.5.2 Set cos information

KmeSetSystemData.deviceData.sysData.cos [`INTEGER`]

X.6 Fowarding

X.6.1 Get Forwarding

GetForwarinding service (standard)

X.6.2 Set Forwarding

SetForwarding service (standard)

X.7 Message Waiting

X.7.1 Get Message Waiting

KmeGetSystemDataReq.deviceData.sysData.messageWating with deviceID

[Return] `SEQUENCE OF DeviceID`

X.7.2 Set Message Waiting

CallBackMessage Call-Related (standard)
CallBackMessage Non-Call-Related (standard)
CancelCallBackMessage (standard)

X.8 Wakeup

X.8.1 Get Wakeup information

KmeGetSystemDataReq.deviceData.sysData.wakeUp

[Return]

```
KmeWakeUpInfo ::= SEQUENCE
{       time            [0] KmeWakeUpTime    OPTIONAL,
        schedule        [1] KmeWakeUpSchedule}

KmeWakeUpTime ::= SEQUENCE
{       hour            [0] IA5String(SIZE(2)),
        minute          [1] IA5String(SIZE(2))}

KmeWakeUpSchedule ::= ENUMERATED
{       noSchedule      (0),
        once            (1),
        everyday        (2)}
```

X.8.2 Set Wakeup information

KmeSetSystemData.deviceData.sysData.wakeUp [KmeWakeUpInfo]

X.9 Extension Name

X.9.1 Get Extension Name (List of devices)

KmeGetSystemDataReq.extensionGroup

[Return]

```
KmeExtTrkGroupList ::= SEQUENCE OF SEQUENCE
{       groupNo         [0] INTEGER,
        name            [1] CHOICE
        {       single          [0] OCTET STRING(SIZE(1..20)),
                wide            [1] OCTET STRING(SIZE(1..40)) }    OPTIONAL,
        tenantNo        [2] INTEGER    OPTIONAL }
```

X.9.2 Set Extension Name

KmeSetSystemData.deviceData.sysData.extName [KmeExtName]

```
KmeExtName ::= CHOICE
{       single          [0] OCTET STRING(SIZE(0..20)),
        wide            [1] OCTET STRING(SIZE(0..40)) }
```