Local Synchronization with IrMC

Alcatel OT756

Mobile Equipment / Server Protocol Functional Requirements

HISTORY

Version	Date (mm/dd/yyyy)	Change note
1.0	04/30/2003	Document released
2.0	03/04/2004	Doc released.

TABLE OF CONTENTS

1 Introduction

1.1 Document Introduction

This document presents the mobile specification to fulfill the PIM local synchronization requirement defined in the document [1].

1.2 Reference documents

1.2.1 Internal documents

[1] TH4 PC Suite – PC PIM Synchronization Requirements
mPD/TD/PSA/E2E/0068.2003 v 1.4 RL

[2] BH4 bitmaps coding
ACT(00)/BH4/UCS2/ 8_bits V1.0

[3] SFAN IrMC synchronization
SW/SFAN/IRMC_SYNCHRONIZATION/TH4/256.2003/V1_1 V1.2

1.2.2 External documents

[4] ISO 639

[5] IrMC 1.1 standard Package

[6] OBEX Standard Specification v1.2

2 Requirements summary

Req. Number	Comment
1	PC OS and applications
2	OT756 ME applications to synchronize
3	PC applications user choice
4	Synchronization mode
5	Multi-application synchronization
6	Synchronization activation
7	Language Support
8	MMI requirement on OT756
9	Transmission medium
10	Characters encoding
11	Policy for conflict resolution
12	Partial Sync

Refer to the chapter 4 for more details about these requirements.

3 Open Points summary

4 MOBILE REQUIREMENTS

This section describes general principles and MMI requirements that have been adopted to support the PIM synchronization functionality.

4.1 PC OS and applications

Refer to Doc[1] section 2.2 for details.

4.2 OT756 ME Databases To Be Synchronized

- The OT756 data base which can be synchronized are the following:
  - PIM contacts data base
  - PIM appointments data base
  - PIM todos data base

4.3 Import, Export and Synchronization of OT756 PIM

- The user has to select, for each OT756 database, the PC application such as outlook, to be used by the sync client.
- The user has to select, for each OT756 database, in one of the following way:
  - The importation of the data from the PC to the mobile
  - The exportation of the data from the mobile to the PC
  - The synchronization between the OT756 database and the PC application database.

Refer to section 6.6 for further information.

4.4 Synchronization mode

ME OT756 has to support slow, semi-slow and fast synchronization in accordance with the principles described in doc[4] 5.1.

4.5 Multi-Application synchronization

The synchronization principle must allow synchronizing the OT756 ME PIM databases with many PC applications that rely on the same synchronization technology.

4.6 Synchronization activation

- Synchronization between the Mobile Equipment and the PC application shall be activated from the PC. However, depended on the transmission media used (refer to 4.9), the following behaviors should be applied for the ME:

  - IRDA as the media
    A User action from the ME should be initiated in order to establish the IRDA connection with the PC. Once both PC and ME have been paired, no User action should be expected than starting the synchronization process from the PC.

- Synchronization software on PC has to check that the mobile is a OT756 ME. The OT756 synchronization software must not synchronize a ME other than a OT756 ME. To ensure that, the OT756 synchronization software on PC has toidentify the ME type from the IrMC device log (Refer to section 6.9 for the specification of the OT756 device log) provided by the ME (Refer to section 8.7 for the procedure). Only compatible ME shall be accepted, if the ME is not compatible the PC must abort the synchronization and display an error message for the user to explain that it has to connect a compatible ME. (Refer to doc[1] section 2.7 and 2.8)

- Synchronization of a OT756 ME by Alcatel synchronization software other than Alcatel OT756 sync software must be also prevented. That should be ensured by the compatibility check during the synchronization(Refer to the section 8.7).

4.7 Language Support

The compatibility of languages used by the PC and the mobile must also be checked. To assume that, the OT756 ME will provide a list of the embedded supported languages in the IrMC information log (Refer to section 6.8 for the specification of the OT756 information log). The PC application is in charge of the compatibility check according to the information provided by the OT756.
Refer to doc[1] section 4.4 for the PC side requirements and the complete list of languages supported by the OT756 product line.
Note that a mobile may only support up to 5 languages in the list.

4.8 MMI requirements on OT756

OT756 MMI will be notified upon starting of synchronization and present to the User a «frozen interface», only providing with informational messages and icon displayed as usual.
It means that while synchronizing, the user cannot activate other OT756 applications and more particularly, access to the PIM database.
however, he could :

- Interrupt the synchronization by pressing a key (CLEAR key)(open point 7)
  Not supported. The current synchronization may be manually aborted from PC side.

- Accept an incoming call

In this case, synchronization process may be stopped (case of IRDA link failure by moving by mobile phone) and all outstanding data have to be correctly updated at the point the synchronization stopped. The mobile may also send the abort message to the PC in this case.

- Reject an incoming call

In this case, the synchronization is not stopped. (open point 5)

4.9 Transmission Medium

Synchronization between OT756 PIM application and PC applications will use only the IrDA technology.
- Alcatel device nickname is "Alcatel OTXXX" where XXX is the number of the commercial name to be defined.
- The PC and mobile should attempt to reestablish the link for 40 seconds in case of IrDA failure (negotiation time between PC and mobile).
- The maximum bit rate is 115.2K baud

4.10 Characters encoding

- UTF-8 mandatory in the vCard and in the vCal. Objects.

4.11 Category name change

- Any change on CATEGORY name will be reflected in the change log file to support synchronization of category field of PIM contact(vCard property: X-ALCATEL-CATEGORY), see the section 6.14 and 7.3 for details. (Open point 6)

4.12 Policy for conflict resolution

The end user shall be able to choose a policy to resolve a conflict that a same object has been modified in PC PIM and the OT756 PIM respectively. Refer to doc[1] section 4.3.10 for the details.

4.13 Partial Sync

The sync client shall allow the end user to define various criteria for partial sync.
Refer to section 6.4, section 6.5 and the doc[1] section 4.3.5 for the details. (Open point 4)

4.14 Birthday management

- With some PC PIM applications, the user can define the birthday date in a record of a contact . Among those applications, some of them (example MS-Outlook) create a recurrent yearly event in their calendar data bases corresponding to this birthday automatically. As the sync client takes into account the calendar record to synchronize

with the OT756 appointment data base, the creation of the birthday in a contact of a PC PIM can indirectly create a yearly repeat appointment in the OT756 PIM during a appointment data base synchronization. To those PC PIM applications that do not automatically create a recurrent yearly event in their calendar database corresponding to the birthday field in the contact database, the sync client should create a recurrent appointment record (a vCal. Object) in the OT756 while synchronizing a contact record with the birthday field. The sync client shall handle this situation transparently to the OT756 and the PC PIM applications as well.

- In all other cases, the synchronization of the appointment data base has no direct impact on the contact data base, and vice versa.

4.15 Support CATEGORY property in vCard

The CATEGORY property is a Alcatel customized property for vCard object. The value of the CATEGORY property is "category name", which identifies which category a contact record (vCard object) belongs to. The maximum number of category names in the OT756 is 15, including two pre-defined categories.
While the pc client sends a category name which is not existed in the OT756, the OT756 will check whether there is a vacant category available: if NO, the OT756 will discard this category name and put this vCard object under the default category; if YES, the OT756 will create a new category for this category name and put this vCard object under this new category.PC application MMI
The FRD document does not specify all the MMI aspects of the PC application. Refer to the doc[1].

4.16 The call management

The mobile end user is able to setup an appointment record that is related to a contact record in the OT756, through a field that is not synchronizable. To avoid losing call information during the sync session, the OT756 will extract the name and the phone number from the contact record and append them to the subject field of the appointment. Since the subject field of the appointment record will be synchronized with PC PIM, thus the call information of a appointment will be synchronized as well.
In fact this is the MMI behaviour and it's transparent for IrMC server and client. IrMC server and client don't need to handle it.

5 functional architecture

Function and interfaces involved at both sides of the synchronization process are represented in the fig I.

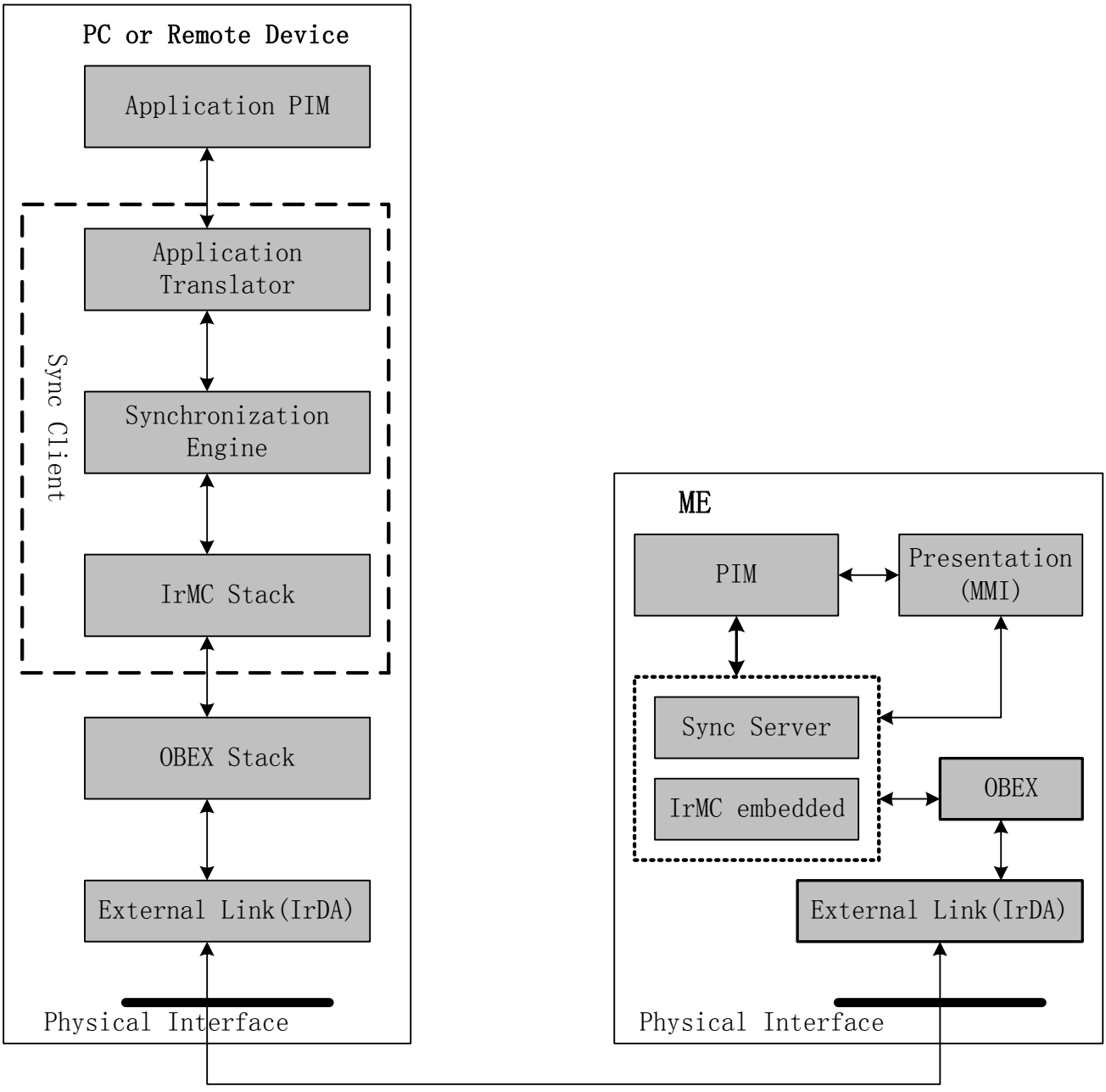


Fig. I: Functional architecture of the PIM synchronization

5.1 The Role of the Application Translator

The application translator of the sync client is a adaptor to the various PC applications such as outlook express, lotus. Due to limitation of the OT756 PIM and/or limitation of PC application PIMs, a adaptor is needed for mapping PIM fields to vCard/vCalendar object properties and performing necessary transformation. A adaptor shall be able to modify its adaptation rules by the end user. Some specific rules may be required by the marketing department.

6 Definitions and Constraints of the PC/OT756 interface

The sync interface between PC and the OT756 ME is defined in IrMC 1.1 standard.

6.1 The Synchronization Mode

The OT756 shall support three synchronization modes:
Slow,
Semi-Slow,
Fast.
Please refer to the IrMC 1.1 standard for the synchronization definitions.

Besides the adoption of sync procedures recommended by IrMC, the following principles are also applied on OT756 IrMC sync:

- The sync session shall be initiated by the sync client (PC).
- The PUSH commands are not implemented on the OT756, which means that the OT756 will not initiate a IrMC sync.
- The OT756 PIM database will be set to "synchronized" only after sync session finishes successfully.
- If the current sync session is aborted by any reason, the sync client shall be in charge of locating the abort point in the change log in order to resume the sync session in the next sync session. If the sync server feels that the resume can not be conducted appropriately, it will ask for a semi-slow sync
- The OT756 only supports one to one "fast" sync, that is a ME shall perform a synchronization with only one PC side sync software. As soon as the ME user will synchronize its PIM database with another application than the current identified application, this first synchronization mode must be a "Slow" synchronization mode. Once the process is complete, the new application becomes the current one and "Fast" synchronization mode may be used for the next synchronization of the PIM data with this application.

6.2 The Change Log

The Change Counter is the ONLY sync anchor supported by the OT756.

The OT756 does NOT store the Stored Change Log.

The OT756 builds the Transmitted Change Log dynamically.

The OT756 ONLY implements the reduced Change Log (Refer to the IrMC 1.1 section 5.5.3 for details):

- Each PIM database record may have and ONLY have one(the newest) change object in the change log file.

- The order of change log items is in a chronological way. The change object with the biggest change counter is the newest change and is the first item in the log file.

- The hard/soft delete is not supported.

- If the current sync session is aborted for any reason, the records of the PIM database will NOT be set to "synchronized" even some of the records have been synchronized. Here are two solutions for this situation:

  - **Solution 1**: To keep implementation simple, the sync server will ask for a "**semi-slow**" sync in the next sync session, which will assure the database synchronized properly.

  - **Solution 2**: To resume from the abort point, the stored change counter in the sync client rolls back to the original one before the sync or the sync client may decide the recover point for the resume and at the next sync, the sync client sends this change counter to the sync server, then the sync session will be a "**fast**" sync and the database can still be synchronized properly(the modifications during last aborted sync may be performed again, but the result will be same).

- If the OT756 feel that there are too many changes in the database since last sync (too many change objects in the change log file), it may ask for a semi-slow sync. (Open Point 3)

6.3 Users management and data integrity

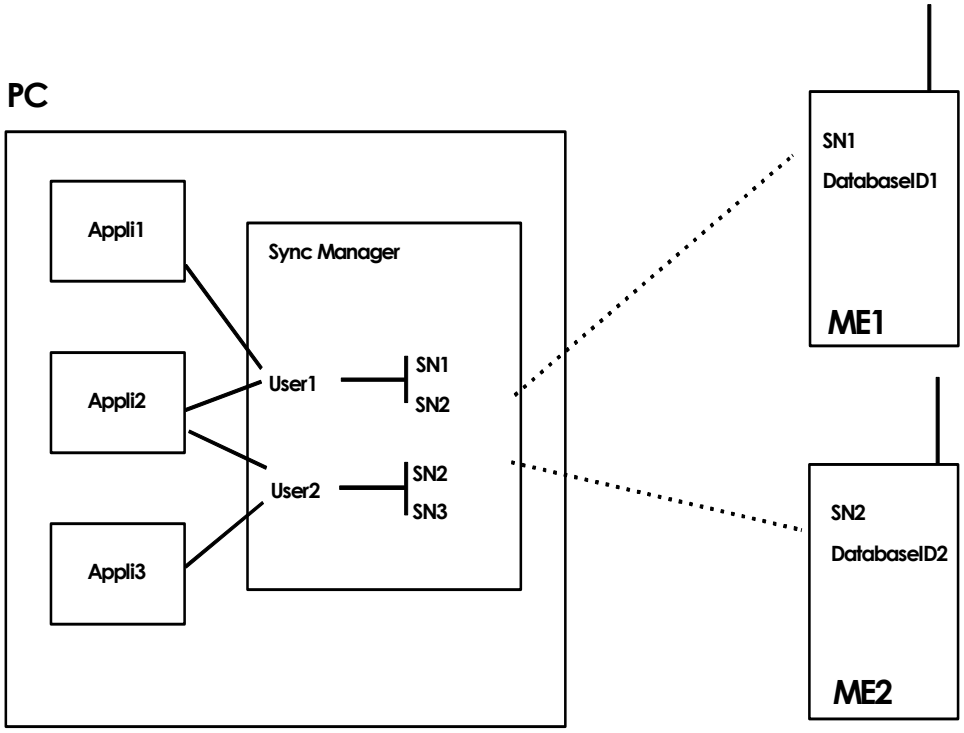
To allow synchronization with multiple OT756 MEs, the sync client shall manage the following identifiers:

Serial Number

The serial number property identifier in the device info object specifies the serial number of the OT756. In the OT756, this serial number is **IMEI**. The OT756 ME shall include this SN in the Change log to be identified by the PC sync software. Considering the principles of synchronization, there would have as many Serial Numbers as applications shared by one user on the desktop.

Database ID

The Database ID will identify the databases in the OT756. Refer to the doc[8] section 5.3 for details. The OT756 ME must include the Database ID in the change log. The database ID must be stored in the OT756 ME memory.



ME2 has synchronized its database with the application2 and has been identified as the User2

ME1 has synchronized its database with the application1 and has been identified as the User1

Fig. 2 : User and database management

Before starting a synchronization process, the sync engine will apply the following algorithm :

- It will retrieve the Serial Number and Database ID from the ME, which corresponds to the IDs of the most recent synchronized PIM application on the PC.
- If the Serial Number is not recognizable to the sync engine (ME has never been synchronized), the sync client will start the operation selected by the user (**import, export** or **slow synchronization)**.
- If the Database ID is unknown(the database in ME is reset), the sync client will start the operation selected by the user (**import, export** or **semi-slow synchronization)**.
- If the Serial Number and Database ID match with the data of the current application user, it means that the sync engine may initiate a **fast** synchronization process. Else, the fast synchronization is not possible.

6.4 Filtering criteria

Filtering criteria only apply in **fast s**ynchronization mode.

Filtering criteria set by the PC application user allows the PC application to synchronize records that have changed since the last synchronization and that fulfill these criteria.(Refer to the doc[1] section 4.3.5 for the details)

The OT756 will NOT provide customized change log for these criteria. The OT756 only provide change log defined in the IrMC standard. It is responsibility of the PC application to perform filtering.

Note that although those records that do not fulfill filtering criteria are not synchronized, the sync client shall take this data inconsistency situation into account in the next sync session.

6.5 The separated vEvent and vTodo synchronization

The OT756 supports vCard and vCalendar object stores synchronization, and the separated vEvent and vTodo synchronization as well.

In the OT756, the vCalendar object store comprises two separated object stores, which are vEvent object store and vTodo object store respectively. The sync client shall allow the end user perform the IrMC sync on vEvent and vTodo object store respectively or the vCalendar object store.

The naming rule of the vCalendar has to be extended to support this feature:

To the vEvent object and object store, the naming rule is:
vEvent change counter object name::= “telecom/cal/event/luid/cc.log”
vEvent change counter log name::= “telecom/cal/event/luid/”<change-counter>”.log”
vEvent stream object name::= “telecom/cal/event.vcs”
vEvent unique indexed object name::= “telecom/cal/event/luid/”<luid>”.vcs
A vEvent object also has a vCalendar object name::= ”telecom/cal/luid/”<luid>.vcs”
Note that the “<luid>” in the two object names are the same.

To the vTodo object and object store, the naming rule is:
vTodo change counter object name::= “telecom/cal/todo/luid/cc.log”
vTodo change counter log name::= “telecom/cal/todo/luid/”<change-counter>”.log”
vTodo stream object name::= “telecom/cal/todo.vcs”
vTodo unique indexed object name::= “telecom/cal/todo/luid/”<luid>”.vcs
A vTodo object also has a vCalendar object name::= ”telecom/cal/luid/”<luid>.vcs”
Note that the “<luid>” in the two object names are the same.

The vEvent and vTodo share the same cc of the vCalendar, nonetheless, the last known CCs of the vEvent, vTodo and vCalendar object store in the sync client may be different as these three object stores may have synced independently.

In order to improve performance, the sync client should always use vEvent and vTodo unique indexed object name wherever possible(even during vCalendar synchronization session).

In case that the sync client can not or need not distinguish type of a vCalendar object(vEvent or vTodo), the sync client should use vCalendar object name.

The extended naming rules and the separated vEvent and vTodo synchronization shall have no influence on the normal vCalendar synchronization even the PC application that does not support separated vEvent and vTodo synchronization.

6.6 Definition the PIM data

The PIM Data can be :

- Appointments
- Todos
- Contacts

6.6.1 Particular case of recurring item

If the repeat structure used by another application is not supported by the ME, the sync client shall **fan individual instances** of the recurring item **up to the appropriate fanning limits overridden by the information log** of the OT756.

If the OT756 do not override fanning limits, the sync client will apply default fanning limits to the unsupported recurring events. These values are provided by the sync client.

- The sync client shall fan recurring objects with unsupported repeat structures into individual instances whose repeat patterns can be supported by the OT756(See section 7 for details).
- The sync client shall handle the fanning of recurring item for various PC applications if necessary as well.
- The sync client shall maintain the relations between recurring objects and individual instances of them to make sync transparently and keep data consistency without losing any information.

6.7 Import and Export of the OT756 PIM

The Import and Export operation must be initiated by the PC sync client.

- In the case of the importation, 2 options are possible:

  Erase old mobile phone database, then import PC database in the mobile phone. So ME has to support database complete removing following by a database importation form the PC. (IrMC Level 2 PUT, see section 8.5 and doc[4] 5.7.7 for details)

  Merge in the mobile phone, the old mobile phone database and the PC database. So ME must be able to store the data provided by the synchronization software on PC in its own OT756 PIM database. In fact, it consists of simple record creations on OT756 database side. After importation of the data from PC to the OT756, the data might be inconsistent in the PC and the OT756, in this case, the sync client may reset stored system anchor, thus the next sync session will be a semi slow sync. (See section 8.6 for details)

- The behavior of the exportation of date from the OT756 to the PC is defined by the sync client: erase old database in PC and import it all from the OT756, or, merge data from the OT756 into PC database. In either way, the sync client shall reset the stored system anchor in order to perform slow or semi slow sync in the next sync session whenever it feels the data in PC and the OT756 might be inconsistent.

6.8 Link failure, memory reclaim, compaction and database busy state impacts on synchronization process

Link failure:

The IRDA link failure must be acknowledged after 40 seconds of undetected IRDA frame and the sync client should abort the sync session right after link failure is detected.

Memory reclaim and compaction:
During the sync session, some OT756 internal operations such as memory reclaim and compaction may be necessary and could take more than a few seconds, especially for compaction. Database can be busy on the sync connection phase or during the sync session.
Generally, the sync client will not be aware of the operations on the OT756, the sync server may return database busy or other error messages and the sync client shall maintain a few timers for the interval of the response from sync server:

- In the connection phase, **the timeout value for the response is 10 seconds.**
- During the sync session, **the timeout value for the response is 5 min.**

After timeout, the sync session is aborted by the sync client.

Busy state:
A database may be busy when the PC application start the synchronization session. In this case, the database synchronization can't begin and the mobile has to return a error to the PC. **The sync client shall abort the current sync session.**

The sync client should response to the end user that there might have some problems on opening the OT756 PIM and let the end user decide what to do next: retry or cancel.

6.9 Definition of the External Link

The External Link will be characterized by:

- The Physical Link
- A Link Protocol associated to the Physical Link

For OT756, the only physical Link used for the IrMC is the IRDA link.

The OT756 **IrMC** synchronization will be based on the connection-oriented **OBEX** and **IrDA.**
To ensure the OBEX connectivity with the OT756, the pc sync client must be fully compliant with OBEX standard specification v1.2 (Refer to doc[5]).

6.10 The Device Information Object

As defined in the IrMC 1.1.

The Device Information Object can be used in synchronization to obtain the serial number and supported language list of ME.

Following is a table that summarizes the property values of the object. If the Presence Status is 'N', this property will not present in the Device Information Object.

Property Identifier	Presence Status (Y/N)	Value (ascii coded)	Comment
MANU	Y	Alcatel	Manufacturer
MOD	Y		Product name, for example « OT735 ».
OEM	N		
FW-VERSION	N		
FW-DATE	N		
SW-VERSION	Y	TH4-P	
SW-DATE	N		
IRMC-VERSION	Y	1.1	Specify the version of IrMC supported
HW-VERSION	N		
HW-DATE	N		
SN	Y		Serial number of ME
PB-TYPE-TX	Y	VCARD2.1	Identify the Phone Book format that the ME can transmit.
PB-TYPE-RX	Y	VCARD2.1	Identify the Phone Book format that the ME can receive.
CAL-TYPE-TX	Y	VCAL1.0	Identify the Calendar format that the ME can transmit.
CAL-TYPE-RX	Y	VCAL1.0	Identify the Calendar format that the ME can receive.
MSG-TYPE-TX	Y	NONE	Message object is not supported, and this value must be 'NONE'

MSG-TYPE-RX	Y	NONE	Message object is not supported, and this value must be 'NONE'
NOTE-TYPE-TX	Y	NONE	Note object is not supported, and this value must be 'NONE'
NOTE-TYPE-RX	Y	NONE	Note object is not supported, and this value must be 'NONE'
INBOX	Y	SINGLE	The ME Inbox cannot receive Obex frames containing multiple objects. *(TBC)*
MSG-SENT-BOX	Y	NO	Message object is not supported
X-ALCATEL-LANGUAGE-ID	Y		A sepcial extension property to specify the supported language list of ME. Its value *must comply with the definiton of doc[3]*, and each lauguage ID is separated by a semicolon ' ;'. For example : X-ALCATEL-LANGUAGE-ID:zh;en;fr;de;ar
MPF	Y	0	Multipile Add/Delete/Modify File is not supported .

6.11 Phone Book Information Log

As defined in the IrMC 1.1.

Phone Book Information Log Object contains general information about PIM Contact table (i.e. Phone Book Object Store). *It is defined in section 2.9 and section 7.7.1 of doc[4].*

According to Errata_991014 of doc[4], lines in information log should not be longer than 75 octects, excluding the line break. Long content lines SHOULD be split into a multiple line representations, using a *line folding* technique.

Following is a table that summarizes the property values of the object. If the Presence Status is 'N', this property will not be present in the Device Information Object.

Property Identifier	**Presence Status (Y/N)**	**Value (asicii coded)**	**Comment**
Total-Records	Y		The total number of records of PIM Contact.

Last-Used-Index	N		Used only for IrMC level 3.
Maximum_Records	Y		The maximum number of records that PIM Contact can store.
IEL	Y	0x08	The level of Information Exchange supported is level 1, 2 and 4.
HD	Y	NO	PIM Contact doesn't make a distinction between hard and soft deletes.
SAT	Y	CC	Support change counter only as the Sync Archor Type.
SAI	N		Only for the use of Timestamp as Sync Archor Type.
SAU	N		Only for the use of Timestamp as Sync Archor Type.
DID	Y		Indicates the database Id.
X-IRMC-FIELDS	Y		See the table below.
ICL	Y	NO	Incoming Call Log is not supported.
OCL	Y	NO	Outgoing Call Log is not supported.
MCL	Y	NO	Missed Call Log is not supported.
SIM1-Main-Linked	Y	NO	Errata000114 of doc[4]
SIM2-Main-Linked	Y	NO	Errata000114 of doc[4]
SIM1-Main-Copy	Y	NO	Errata000114 of doc[4]
SIM2-Main-Copy	Y	NO	Errata000114 of doc[4]
ECL	Y	NO	Errata991014 of doc[4]

In section 2.9.10 and 7.8.5 of doc[4], X-IRMC-Fields are defined to enable an IrMC client to understand the capability of ME's Phone Book. Following is the content:

```
X-IRMC-FIELDS:
<Begin>
VERSION:
N[1;2]:
ORG[1]:
```

```
TITLE:
NOTE:
X-TEL-FIELDS:7
TEL;TYPE=PREF:=61
TEL;TYPE=WORK:=61
TEL;TYPE=FAX:=61
TEL;TYPE=PAGER:=61
TEL;TYPE=CELL:=61
TEL;TYPE=HOME:=61
TEL;TYPE=VOICE:=61
EMAIL;TYPE=INTERNET:=50
EMAIL;TYPE=WORK:=50

ADR[3;4;5;6;7]:
X-ALCATEL-CATEGORY:
X-ALCATEL-CUSTOM:
X-ALCATEL-CUSTOM:
X-ALCATEL-CUSTOM:
X-ALCATEL-CUSTOM:
<End>
```

6.12 Calendar Information Log

Calendar Information Log Object contains general information about PIM Appointment table and Todo table (i.e. Calendar Object Store). *It is defined in section 2.9 and section 8.6.1 of doc[4].*

According to the client's request, this Log Object must also be able to support the synchronization of a single PIM Appointment or Todo table.(open point 4)

According to Errata_991014 of doc[4], lines in information log should not be longer than 75 octects, excluding the line break. Long content lines SHOULD be split into a multiple line representations, using a *line folding* technique.

Following is a table that summarizes the property values of the object. If the Presence Status is 'N', this property will not be present in the Device Information Object.

Property Identifier	**Presence Status (Y/N)**	**Value (asicii coded)**	**Comment**
Total-Records	Y		The total number of records of PIM Appointment and/or Todo.
Last-Used-Index	N		Used only for IrMC level 3.
Maximum_Records	Y		The maximum number of records that PIM can store.
IEL	Y	0x08	The level of Information Exchange supported is level 1, 2 and 4.

HD	Y	NO	PIM doesn't make a distinction between hard and soft deletes.
SAT	Y	CC	Only support change counter as the Sync Archor Type.
SAI	N		Only for the use of Timestamp as Sync Archor Type.
SAU	N		Only for the use of Timestamp as Sync Archor Type.
DID	Y		Indicates the database Id.
X-IRMC-FIELDS	Y		See the table below.
ECL	Y	NO	Errata991014 of doc[4]

In section 2.9.10 and 8.6.1 of doc[4], X-IRMC-Fields are defined to enable an IrMC client to understand the capability of ME's Calendar. Following is the Information Log for Calendar Object:

```
X-IRMC-FIELDS:
<Begin>
VERSION:
DESCRIPTION:
DTSTART:
DTEND:
AALARM[1]:
RRULE:
PRIORITY:
CLASS:
STATUS:
SUMMARY:
DUE:X-IRMC-LUID:=11
<End>
```

Please note that mandatory vCalendar Todo fields CATEGORIES, COMPLETED and SUMMARY that are required by doc[4] in section 8.7.2, are not preset in the X-IRMC-Fields definition because these fields are not supported by PIM.

The Information Log for PIM Appointment table(vEvent) only is as following:

```
X-IRMC-FIELDS:
<Begin>
VERSION:
DESCRIPTION:
SUMMARY:
DTSTART:
DTEND:
AALARM[1]:
RRULE:
CLASS:
```

```
X-IRMC-LUID:=11
<End>
```

The Information Log for PIM Todo table(vTodo) only is as following:

```
X-IRMC-FIELDS:
<Begin>
VERSION:
DESCRIPTION:
AALARM[1]:
PRIORITY:
STATUS:
CLASS:
SUMMARY:
DUE:
X-IRMC-LUID:=11
<End>
```

7 The vCard/vCalendar Objects managed by the OT756

This section describes customized vCard/vCalendar objects supported by the OT756 while performing IrMC synchronization.

As mentioned in section 6.1.5, PIM Data manipulated by the PIM of OT756 can be the following primary types:

- Appointments(vEvent)
- Todos(vTodo)
- Contacts(vCard)

7.1 The general constraints and requirements of OT756 IrMC synchronization

Due to the limitation of the OT756 PIM, the vCard/vCalendar objects managed by the OT756 have some constraints, which are described in this section. The information log of the individual database gives a clear specification about properties of the object supported by the OT756. The sync client shall be able to perform run time adjustment according to the information log, since the specification of the objects supported by theOT756 may be varied.

- The OT756 can ONLY support and synchronize the properties of vCard/vCalendar object declared in this section; for the properties of vCard/vCalendar object which are NOT declared in this section, which are none-synchronizable, the OT756 will ignore them in receiving vCard/vCalendar objects (the PC side application may still keep those none-synchronizable properties and The OT756 PIM will keeps its none-synchronizable fields as well). In order to reduce data load, the sync client shall filter them before sending objects. The OT756 will not send a vCard/vCalendar objects with any none-synchronizable properties.

- To those synchronizable properties of the vCard/vCalendar objects, if they were not present, the receiver(the sync server or the sync client) shall reset their correspondent fields in the database. If a same PROPERTY or PROPERTY:PROPERTY PARAMETER combination(such as ADR, TEL;WORK) appear more than once in a vCard/vCal. object, the OT756 will only take the first one and discard all others.

- To some values of some synchronizable properties of vCard/vCalendar that are not supported by the OT756, the OT756 may have uncertain treatment while receiving vCard/vCalendar objects from the sync client. It is responsibility of the sync client to send only OT756 supported values. The sync client may have to do proper mapping/transformation/screening on the values the OT756 not supported.

- If a vCard/vCal. object has some but not all properties which can be recognized by the OT756 but have empty values, these properties will be ignored by the OT756, which means that these properties will be treated as "not present" and the correspondent fields in the OT756 PIM record will be reset. To reduce the data load, we suggest that the PC does not send any synchronizable property with empty value.

- The maximum number of properties in a single vCard/vCal. object is 80. The OT756 will refuse all vCard/vCal. objects with more than 80 properties.

- Because of the constraints of PIM/DB implementation: alcatel PIM/DB can't create a records whose all fields value are empty. For vCal/vCard EMPTY objects in IrMC synchronization, we have some special treatments as below:

    - For vCard EMPTY object, If the PC sync client sends an empty vCard Object to the OT756 while performing create operation(Level2 PUT or Level4 create), the OT756 will accept and store them into PIM by setting a private flag in their records of DB. If the PC sync client sends an empty vCard Object to the OT756 while performing update operation, the OT756 will consider it as delete operation and delete the correspondent record in the database.
    - For vCal EMPTY object(vTodo or vEvent), If the PC sync client sends an EMPTY vCal object to OT756 while performing creation operation(Level2 Put or Level4 create), OT756 will reject these objects and return error. Thus the PC sync client SHOULD not send EMPTY vCal objects to OT756 while performing creation. If the PC sync clents sends an EMPTY vCal object to OT756 while performing update operation, OT756 will consider it as deletion and delete the correspondent records from the database.
    - When the PC sync client performs GET vCard operation, For those EMPTY vCard objects stored in PIM, OT756 will build the following vCard object to the PC sync client:

      For Level 4 vCard object:

      BEGIN:VCARD
      VERSION:2.1
      N;ENCODING=8bit;CHARSET=UTF-8:;
      END:VCARD

      For Level2 vCard object:

      BEGIN:VCARD

VERSION:2.1
N;ENCODING=8bit;CHARSET=UTF-8:;
X-IRMC-LUID:xxxx
END:VCARD

Note: xxxx is the LUID of this object.

An empty vCard/vCal. object identified by the OT756 is defined as :
There is no property, which can fulfill these two requirements, present in the object body:

1. the property can be recognized by the OT756,
2. And the property has none-empty value supported by the OT756.

- The end user shall be able to adjust some of mappings between PC application PIM (such as outlook)data fields and the vCard/vCalendar object properties supported by the OT756 before sync, in a limited way. The sync client shall not allow end user to change default mappings specified in this section if the modification may lead to losing information and/or data inconsistency.
- OT756 handles PIM SUBJECT field. To be compatible with most synchronization software, we have special treatment on vCal SUMMARY and DESCRIPTION(CR MOBil56979).
    - On sending vCal object or vCal stream, PIM SUBJECT field is strictly mapped to vCal SUMMARY property, PIM DESCRIPTION field is strictly mapped to vCal DESCRIPTION property.
    - On receiving vCal object or vCal stream, the mapping behaviour depends on the presences of vCal SUMMARY and DESCRIPTION.
        a) If vCal SUMMARY property exists and not empty, regardless vCal DESCRIPTION, vCal SUMMARY and DESCRIPTION will be saved into PIM SUBJECT field and DESCRIPTION field respectively as it was .
        b) If vCal SUMMARY property is empty or not existing, but vCal DESCRIPTION is not empty, OT756 will save vCal DESCRIPTION into PIM SUBJECT field but leave PIM DESCRIPTION empty.
        c) If vCal SUMMARY and DESCRIPTION are both empty, OT756 PIM SUBJECT and DESCRIPTION fields will be empty too and no special treatment.

    NOTE: In the above case b), this behavior is a OT756 internal behavior and no change log records this change. Thus after a round-trip synchronization(First PC to OT756, then from OT756 to PC), the client may find that vCal SUMMARY and DESCRIPTION are swapped.

The transformation of PIM database records and vCard/vCalendar objects is not in the scope of this document, please see the internal reference doc.[3] for this topic.

7.2 Appointment object

The following table lists all the vCalendar properties supported by the OT756 and the constraints:

The Display name of correspondent fields in the OT756 PIM	PROPERTY OF vCalendar (Keyword)	Description	Maximum Length Of PROPERTY (only applicable to the string

			type value)
"Date"+"Start"	**DTSTART**	Example: **DTSTART**:1*9960401T2359592* *Note : **constraint 1** applied.*	N/A
"Date"+"End"	**DTEND**	Example: **DTEND**:*19960401T2359592* *Note : **constraint 1** applied.*	N/A
"Available time before alarm"	**AALARM**	Example: **AALARM**:*19960415T235000 ;PT5M ;2 ;* *your taxes are due* *Note: **constraint 2** applied.*	N/A
"Description"	**DESCRIPTION**	The description of the vCalendar object.	75 UCS2 characters
"Subject"	**SUMMARY**	A short summary of the vCalendar object.	75 UCS2 characters
N/A	**RRULE**	Only limited **RRULE** expressions are supported. See **constraint 3** for details.	N/A
N/A	**VERSION**	The version of the support vCalendar is 1.0 and previous version. example: **VERSION**:*1.0*	N/A
N/A	**X-IRMC-LUID**	Unique ID associated with the vCalendar	N/A

Constraint 1:

The **DATE**(e.g. *19960401*) part of "**DTSTART"**(*19960401T2359592)* and "**DTEND"** (e.g. *19960401T2359592)* has to be equal, and the **TIME** part of "**DTSTART"** should be equal to or no later than the **TIME** part of "**DTEND",** or the vCalendar object will not be accepted.

Constraint 2:

The period of time if exist (PT5M;2) is ignored, and the note associated (your taxes are due) is ignored also. In order to reduce the size of the object, the sync client should not include these fields in **AALARM** property.

Constraint 3:

The "**RRULE**" expressions supported by the OT756 are listed as following:

RRULE Type	Sub-type	Example	PIM event type	Description
Daily	NA	Dy #z	DailyRepeat	Note 1
Weekly	NA	W1 #z	WeeklyRepeat	Note 2
		Wx #z	WeeklyRepeat	
		W1 TU #z	WeeklyRepeat	

		W1 TU TH #z	MixedByPos	
		Wx TU #z	WeeklyRepeat	
		Wx TU TH #z	NA	
Monthly	By-day	MD1 2 #z	NA	Note 3
		MD1 2 15 #z	NA	
		MD1 1 LD #z	NA	
		MD1 3- #z	NA	
		MDx 2 #z	NA	
		MDx 2 15 #z	NA	
		MDx 1 LD #z	NA	
		MDx 3- #z	NA	
	By-position	MP1 m+ TH #z	NA	
		MP1 m+ TH FR #z	NA	
		MP1 m+ TH n+ TH #z	NA	
		MP1 m+ TH n+ FR #z	NA	
		MPx m+ TH #z	NA	
		MPx m+ TH FR #z	NA	
		MPx m+ TH n+ TH #z	NA	
		MPx m+ TH n+ FR #z	NA	
Yearly	By-day	YD1 100 #z	NA	Note 4
	By-month	YM1 6 #z	YearlyRepeat	
		YM1 6 7 #z	NA	
		YMx 6 #z	YearlyRepeat	
		YMx 6 7 #z	NA	

- x = 2, 3, … (frequency)
- y = 1, 2, … (frequency)
- z = 0, 1, … (duration)
- m, n = 1, 2, 3, 4, 5 (occurrence specifier)
- If the item list length in each example above is equal to 2, the example is also applicable for the cases in which the list length is greater. For example, “Wx TU TH #z” and “Wx TU TH FR #z” are supposed to be of the same kind of examples.

Note 1:

We fully support daily rule.

Note 2:

We partly support weekly rule. If the frequency (x) is greater than one, the item list’s length is restricted to one.

Note 3:

Neither monthly RRULE is supported.

Note 4:

1) Yearly Rule by day is not supported.

2) For yearly rule by month, only one day in the RRULE is supported, other cases are not supported.

There are two methods to represent the end date of a RRULE. One is shown in the table above as duration (#z), the other one is to use an ISO 8610_date_time value (e.g., 19940712T101538).

For more information about RRULE's grammar, see doc[8].

The appropriate fanning should be performed by the sync client in order to split a recurrent vCalendar object into several instances whose RRULEs can be supported by OT756 up to the appropriate fanning limits overridden by OT756 in the information log.

The OT756 fanning limit for a recurrent vCalendar object is 50. The sync client should consider the capacity of the OT756 PIM database before fanning as well. The end user intervention may be needed.

7.3 Todo object

The following table lists all the vTodo/vCalendar properties supported by the OT756 and the constraints:

The Display name of corresponden t fields in the OT756 PIM	PROPERTY OF vCalendar (Keyword)	Description	Maximum Length Of PROPERTY (only applicable to the string)
"Deadline"	**DUE**	Example: **DUE**:*19960401T235959* *Note :* ***constraint 1*** *applied.*	N/A
"Available time before alarm"	**AALARM**	Example: **AALARM**: *19960401T235959;PT5M;2;your taxes are due* *Note :* ***constraint 2*** *applied.*	N/A
"Description"	**DESCRIPTION**	The description of the vCalendar object.	75 UCS2 characters
"Subject"	**SUMMARY**	A short summary of the vCalendar object.	75 UCS2 characters
N/A	**STATUS**	*Note :* ***constraint 3*** *applied.*	N/A
"Priority"	**PRIORITY**	*Note :* ***constraint 4*** *applied.*	N/A

N/A	**CLASS**	*Note : **constraint 5** applied.*	N/A
N/A	**VERSION**	The version of the supported vCalendar is 1.0 and previous version. Example: VERSION:1.0	N/A
N/A	**X-IRMC-LUID**	Unique ID associated with the vCard	N/A

Constraint 1:

In the vTodo object sent by the OT756, the value of time of **DUE**(19960401T235959*)* will be set to 000000; the value of time of **DUE**(19960401T235959) in the vTodo object received by the OT756 will be ignored. In another word, the time part of **DUE** property is not supported and will be ignored. We suggest that the sync client also ignores the value of time of **DUE** during sync session. The OT756 does NOT accept UTC time format, which the value of **DUE** is ending with a 'Z' tag, thus the sync client shall perform a UTC to local time format transformation before sending objects.

Constraint 2:

The period of time if exist (PT5M;2) is ignored, and the note associated (your taxes are due) is ignored also. In order to reduce the size of the object, the sync client should not include these fields in **AALARM** property.

Constraint 3:

The STATUS property of vCalendar is an enumerated type:

{ACCEDPTED, NEEDS AN ACTION, SENT, TENTATIVE, CONFIRMED, DECLINED, COMPLETED, DELEGATED}

The OT756 supports only two enumerated values: COMPLETED and NEEDS. If the STATUS value of a vCalendar object received by the OT756 is set to a value (including NEEDS) other than COMPLETED, it will be stored in the OT756 as NEEDS. If the STATUS value of a vCalendar object that the sync client gets from a OT756 is set to NEEDS and the STATUS of the correspondent object in the sync client database is set to a value other than COMPLETED, the sync client shall ignore this field while updating its database to avoid losing information.

Constraint 4:

The PRIORITY may be one of three values: 1(high), 2(medium), and 3(low), All other values are not supported. The sync client shall do the proper transformation before sync.

Constraint 5:

The CLASS property of vCal is an enumerated type: {PUBLIC, PRIVATE, CONFIDENTIAL}. The OT756 only supports PUBLIC and PRIVATE.

7.4 vCard object

The following table lists all the vTodo/vCalendar properties supported by the OT756 and the constraints:

The Display name of correspondent fields in the OT756 PIM	PROPERTY OF vCard (Keyword)	Description	Maximum Length Of PROPERTY (only applicable to the string)
"First Name" +"Name"	**N**	Example: **N**:*VLADE:ERIC* *Note : **constraint 1** applied*.	The first positional field: 25 UCS2 characters max; The second positional field: 25 UCS2 characters max
"Company"	**ORG**	Example: **ORG**:*Alcatel,Inc. North Division Marketing* *Note : the OT756 supports only one positional field.*	25 UCS2 characters max
"Job title"	**TITLE**	<Property optional>. Example: **TITLE**:*V.P.,Research and Development*	25 UCS2 characters max
"Notes"	**NOTE**	Example: **NOTE**:*RV.with V.P. for lunch*	75 UCS2 characters max
"Work"	**TEL;WORK**	Example: **TEL;WORK**:*01 55 88 77 09* See the **constraint 2** for details.	Max 61 digits phone number
"Main"	**TEL;PREF**	Example: **TEL;PERF**: *01 55 88 77 00* See the **constraint 2** for details.	Max 61 digits phone number
"Fax"	**TEL;FAX**	Example: **TEL;FAX**: *01 55 88 77 91* See the **constraint 2** for details.	Max 61 digits phone number
"Other"	**TEL;VOICE**	Example: TEL;VOICE: 01 55 88 77 99 See the **constraint 2** for details.	Max 61 digits phone number
"Pager"	**TEL;PAGER**	Example: **TEL:PAGER**: *01 55 88 77 00* See the **constraint 2** for details.	Max 61 digits phone number
"Mobile"	**TEL;CELL**	Example:	Max 61 digits phone

		TEL:CELL: *06 55 88 77 99* See the **constraint 2** for details.	number
"Home"	**TEL;HOME**	Example: **TEL:HOME**: *01 55 88 77 10* See the **constraint 2** for details.	Max 61 digits phone number
"E-mail 1"	**EMAIL;INTERNET**	Example: **EMAIL;INTERNET**:*john.paez@yahoo.com* See the **constraint 3** for details.	Max 50 GSM characters including '@' symbol.
"E-mail 2"	**EMAIL;WORK**	Example: **EMAIL;WORK**:*john.paez@abc.com* See the **constraint 3** for details.	Max 50 GSM characters including '@' symbol.
"Address" + "City" + "State" + "Zip" + "Country"	**ADR**	Example: **ADR**:;;*P.O. Box 101 suite 101 123 Main Street ; Any Town;CA;91921-1234;USA* The first two positional fields: "Post office address" and "Extended address" must be empty. If present, the values of the Post office address and Extended address may be appended to the value of the Street positional field. As shown in the above example, the "P.O.Box 101" and "suite 101" are appended to "123 Main Street" in the Street positional field.	The first and the second positional fields must be empty. The third positional field: 75 UCS2 characters max; The 4th positional field: 25 UCS2 characters max; The 5th positional field: 25 UCS2 characters max; The 6th positional field: 10 UCS2 characters max; The last positional field: 25 UCS2 characters max.
"Directory"	**X-ALCATEL-CATEGORY**	Example: **X-ALCATEL-CATEGORY : Professional** The category name of this vCard object. This property may be present only once in the vCard object.	30 UCS2 characters max

"Perso. Info. 1"	**X-ALCATEL-CUSTOM;1**	Example: **X-ALCATEL-CUSTOM;1;Custom 1**:*abc* See the **constraint 5** for details.	30 UCS2 characters max
"Perso. Info. 2"	**X-ALCATEL-CUSTOM;2**	Example: **X-ALCATEL-CUSTOM;2;Custom 2**:*abc* See the **constraint 5** for details.	30 UCS2 characters max
"Perso. Info. 3"	**X-ALCATEL-CUSTOM;3**	Example: **X-ALCATEL-CUSTOM;3;Custom 3**:*abc* See the **constraint 5** for details.	30 UCS2 characters max
"Perso. Info. 4"	**X-ALCATEL-CUSTOM;4**	Example: **X-ALCATEL-CUSTOM;4;Custom 4**:*abc* See the **constraint 5** for details	30 UCS2 characters max
N/A	**VERSION**	The version of the supported vCard is 2.1 and previous version. Example: **VERSION**:*2.1*	N/A
N/A	**X-IRMC-LUID**	Unique ID associated with the vCard	N/A

Constraint 1:

The first value and the second value of "N" property of vCard will be treated as the last name and the first name respectively, all other values of "N" property will be ignored in OT756, and the sync client shall synchronize the first two values of vCard only.

Constraint 2:

The TEL property may be associated with several PropertyParameters. The table below describes the sub parameters supported by the OT756:

Property parameter	OT756 customization
FAX	supported
PAGER	supported
CELL	supported

WORK	supported
HOME	supported
PREF	supported
VOICE	supported
No parameter(Default)	ignored
Other parameters, including MSG, BBS, MODEM, CAR, ISDN, and VIDEO, or any combinations of them	Ignored, the sync client shall filter these parameters.

Note that the sync client shall always use the TEL:VOICE instead of the default value TEL: (no parameter) in the vCard object.

If a same PROPERTY:PROPERTY PARAMETER combination(such as TEL:VOICE) appear more than once in a vCard object, the OT756 will only take the first one and discard others. In this case, the sync client shall let end user decide which one is going to be synced; a mapping table may be needed. The sync client shall also avoid sending vCard objects with repeat properties**. A clear claim will be made in the information log by the OT756 regarding situations like this.**

Constraint 3:

The EMAIL property may be associated with several PropertyParameter. The OT756 only supports two PropertyParameters of the EMAIL property: INTERNET and WORK.

The sync client MUST maintain a mapping between email addresses of PC application PIM and these two email addresses in the OT756 PIM and send NO more than 2 email addresses in a vCard object. The end user should be able to modify mapping before sync.

Constraint 4:

The OT756 PIM supports ONLY ONE address of the vCard. The sync client MUST choose one of multi addresses of PC application PIM to map to the ADR property vCard object of the OT756 for synchronization. The end user should be able to modify the mapping before sync. In case that there are more than one ADR properties in a vCard object, the first one will be accepted and the others will be discarded. The sync client shall filter all other ADR properties except the one chose to be synced.

Constraint 5:

The OT756 supports the four CUSTOM properties of the vCard object, which are coded as: X-ALCATEL-CUSTOM;<Custom field number>; <field name field>: *Field Value*

The custom field number must be one of the “1, 2, 3, 4”. In each CUSTOM property, the OT756 supports only one positional field.

Note that the field name in custom properties of the received vCard object will be ignored by the OT756, and the OT756 will not include this field name in custom properties of the vCard object as

well. Thus the sync client should identify custom properties by custom field number instead of custom field name.

Example:

X-ALCATEL-CUSTOM;4;Custom 4;*it's the value of the custom 4*

8 dynamic of interfaces

The scenarios described in the following diagrams are recommended by the Alcatel for the OT756. The OT756 also supports the scenarios of IrMC synchronization recommended by IrMC standard(Please refer to doc[8]5.6-5.7). The sequences of the message are not strict to the following scenarios.

In the following MSC diagrams, unless specified explicitly, the objects name may be vCard, vEvent, vTodo or vCalendar; the object store name may be one of the following four object stores: vCard object store, vEvent object store, vTodo object store and vCalendar object store, in which, the vCalendar object store is the combination of vEvent object store and vTodo object store.

8.1 Slow Sync (the first sync)

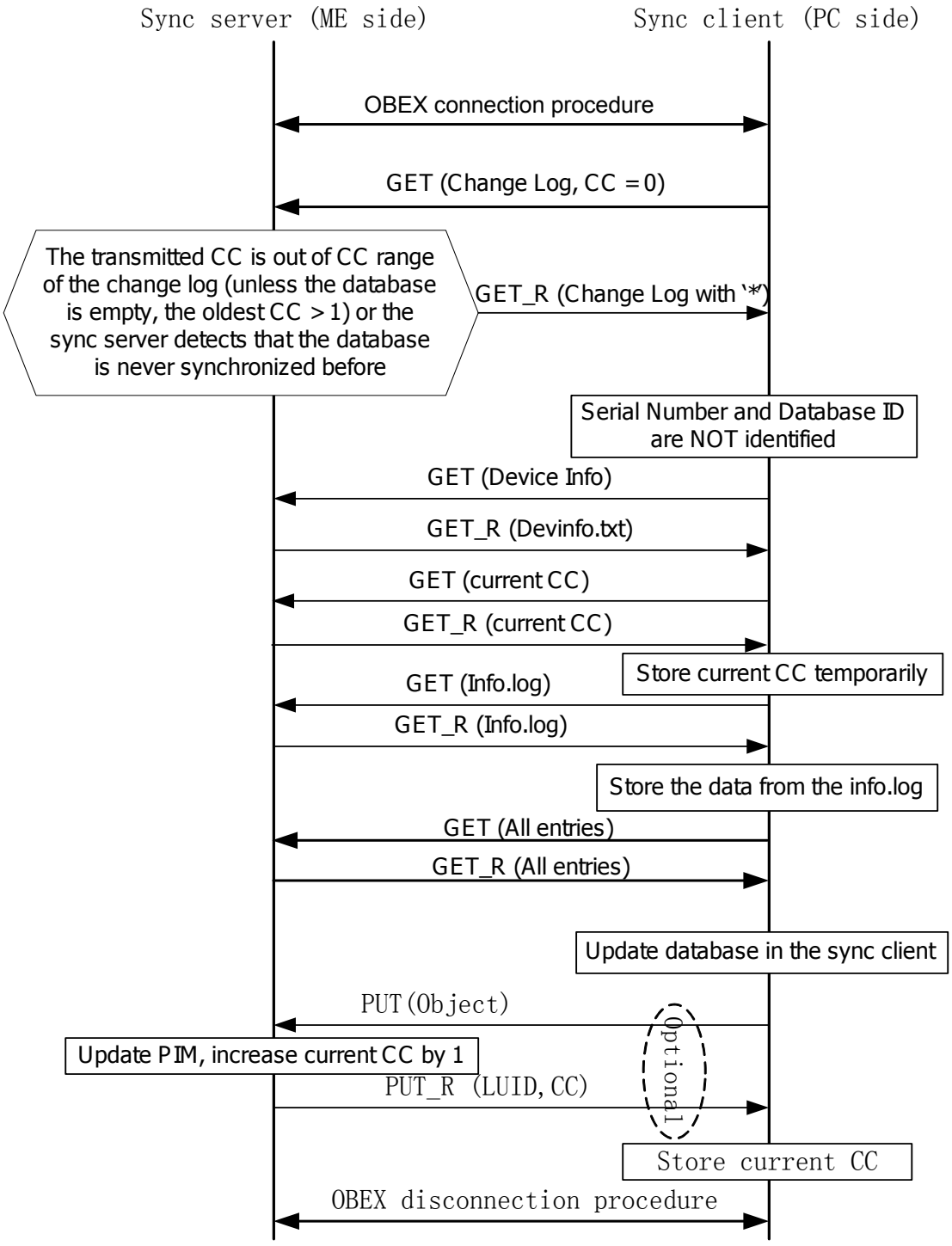


Fig. 3: Slow sync—the first sync

8.2 Fast Sync

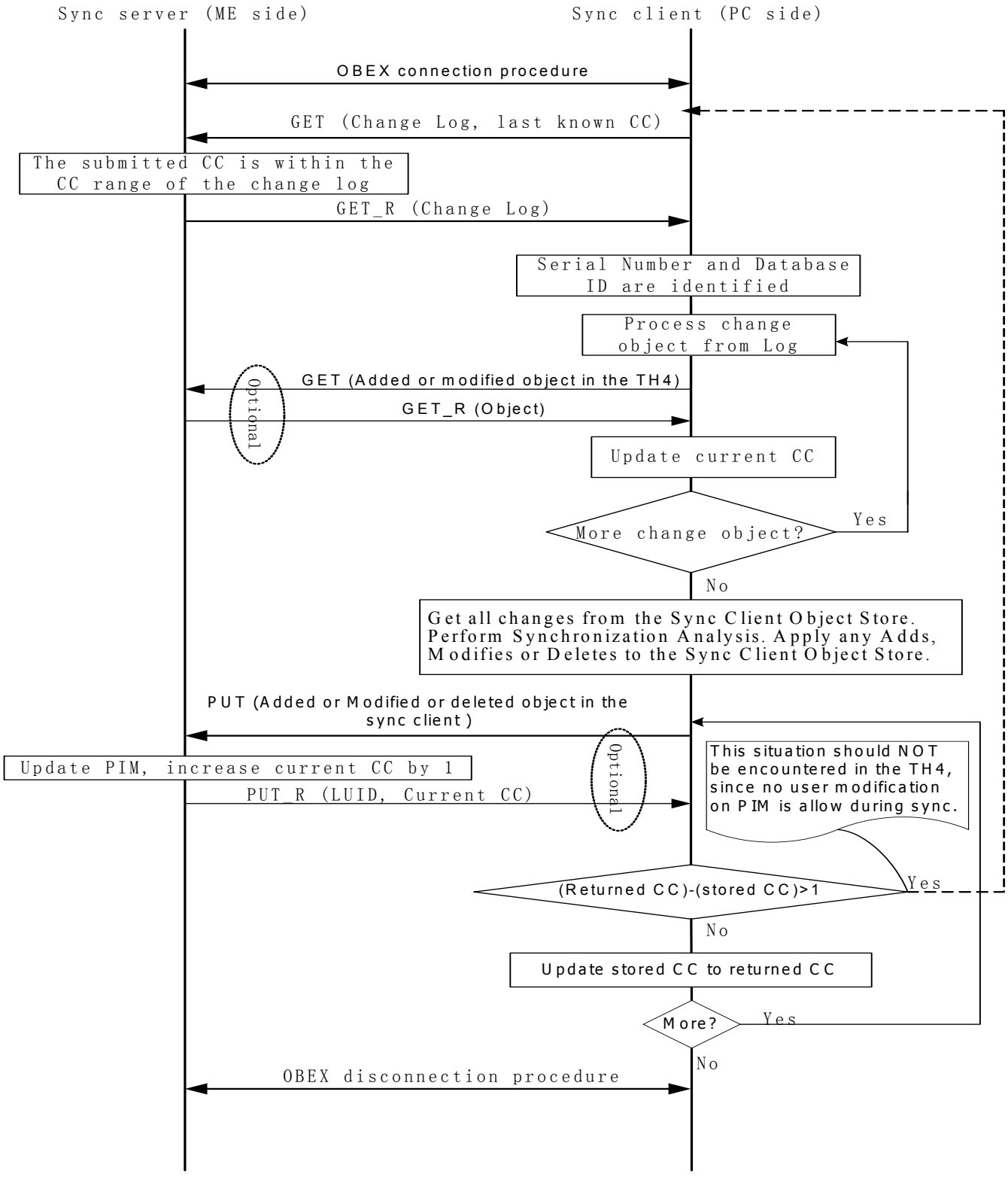


Fig. 4: fast sync

8.3 Semi-slow Sync(the transmitted CC is out of range or too many changes in the database)

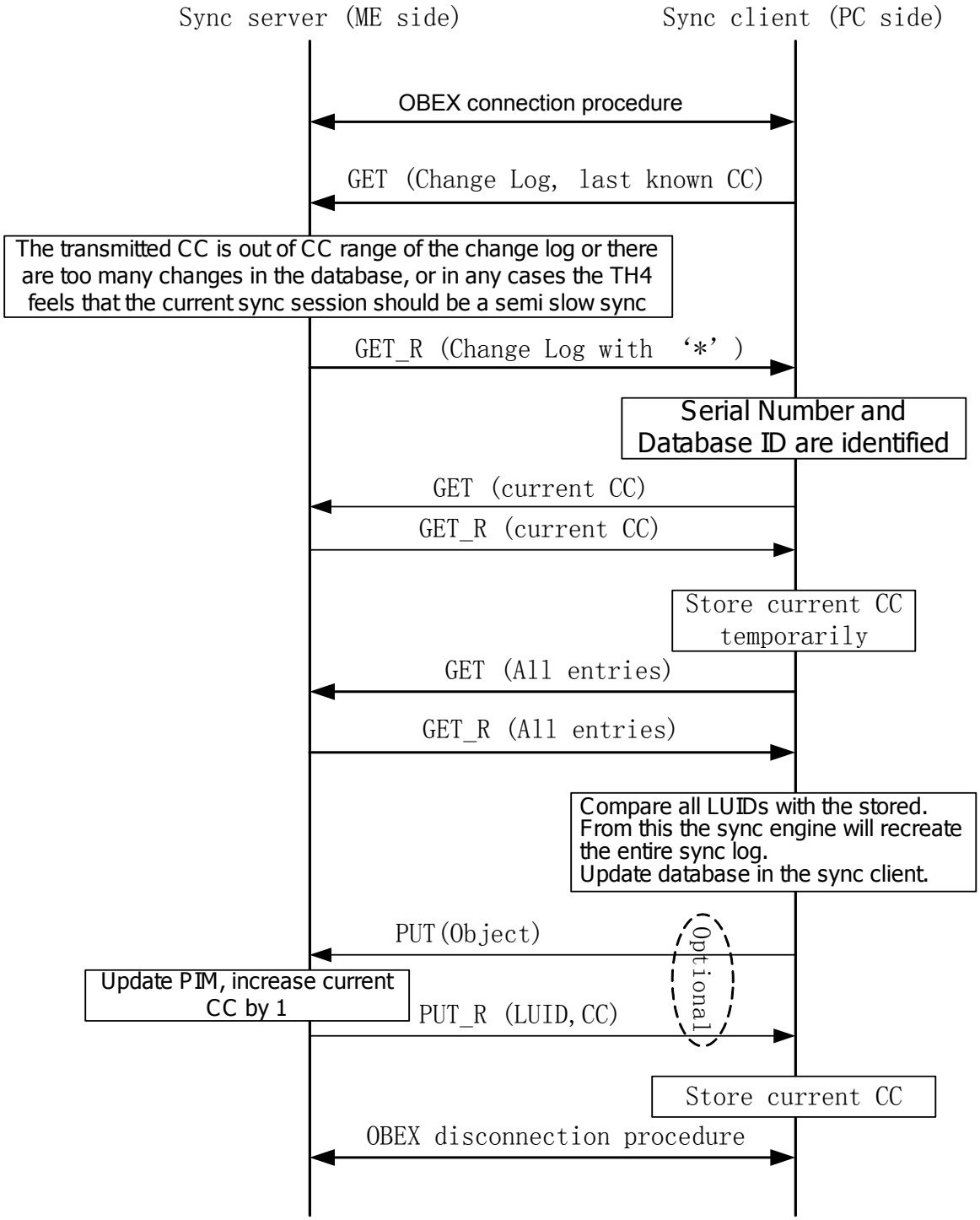


Fig. 5 : Semi slow—unexpected system anchor
Fig. 6 : fast sync--vCard with category

8.4 Reset (The OT756 PIM is reset)

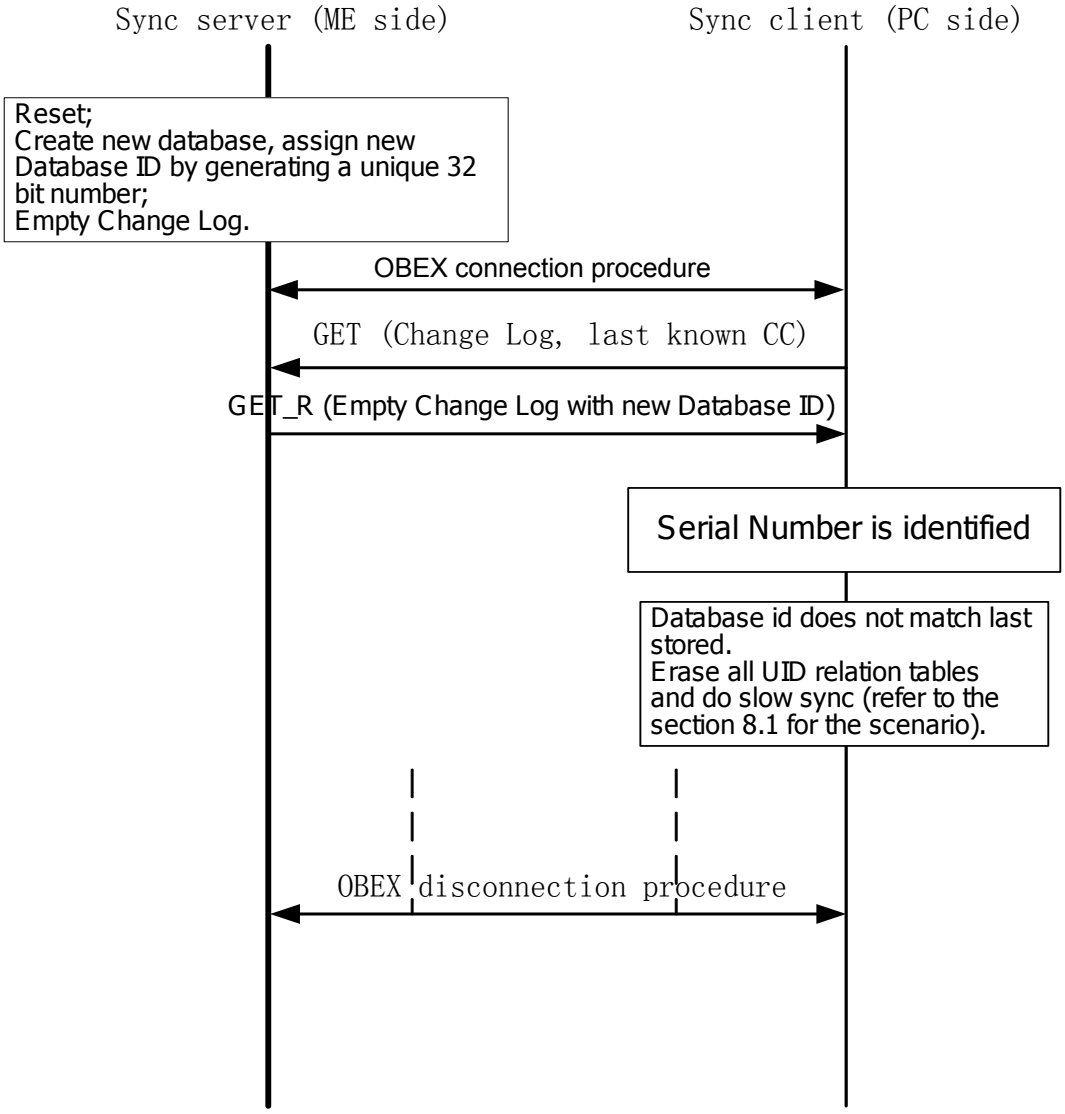


Fig.7 : Reset

8.5 Import from PC PIM (Erase The OT756 old database)---restore

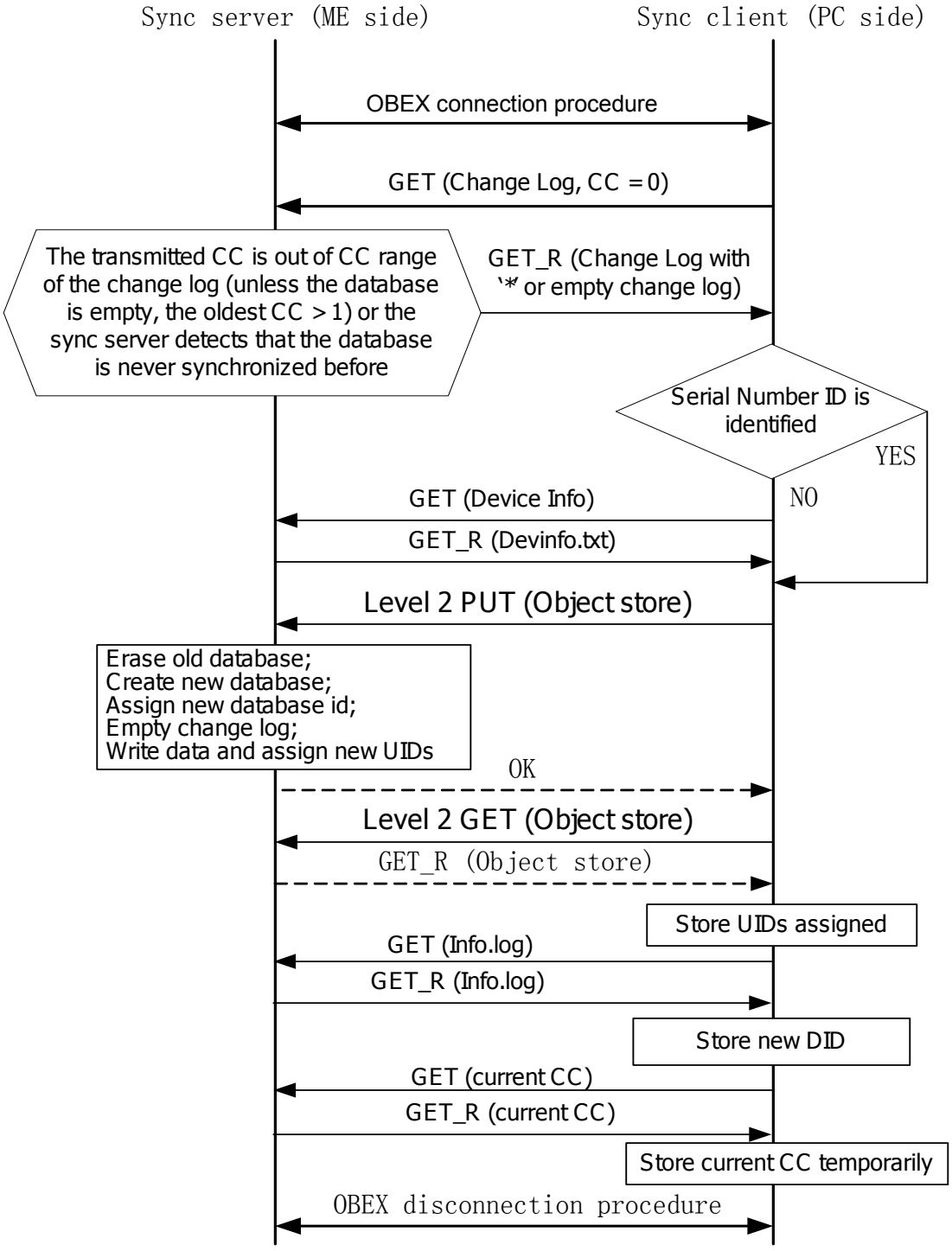


Fig.8 Import (Erase old database)

8.6 Import (Merge with the OT756 old database)

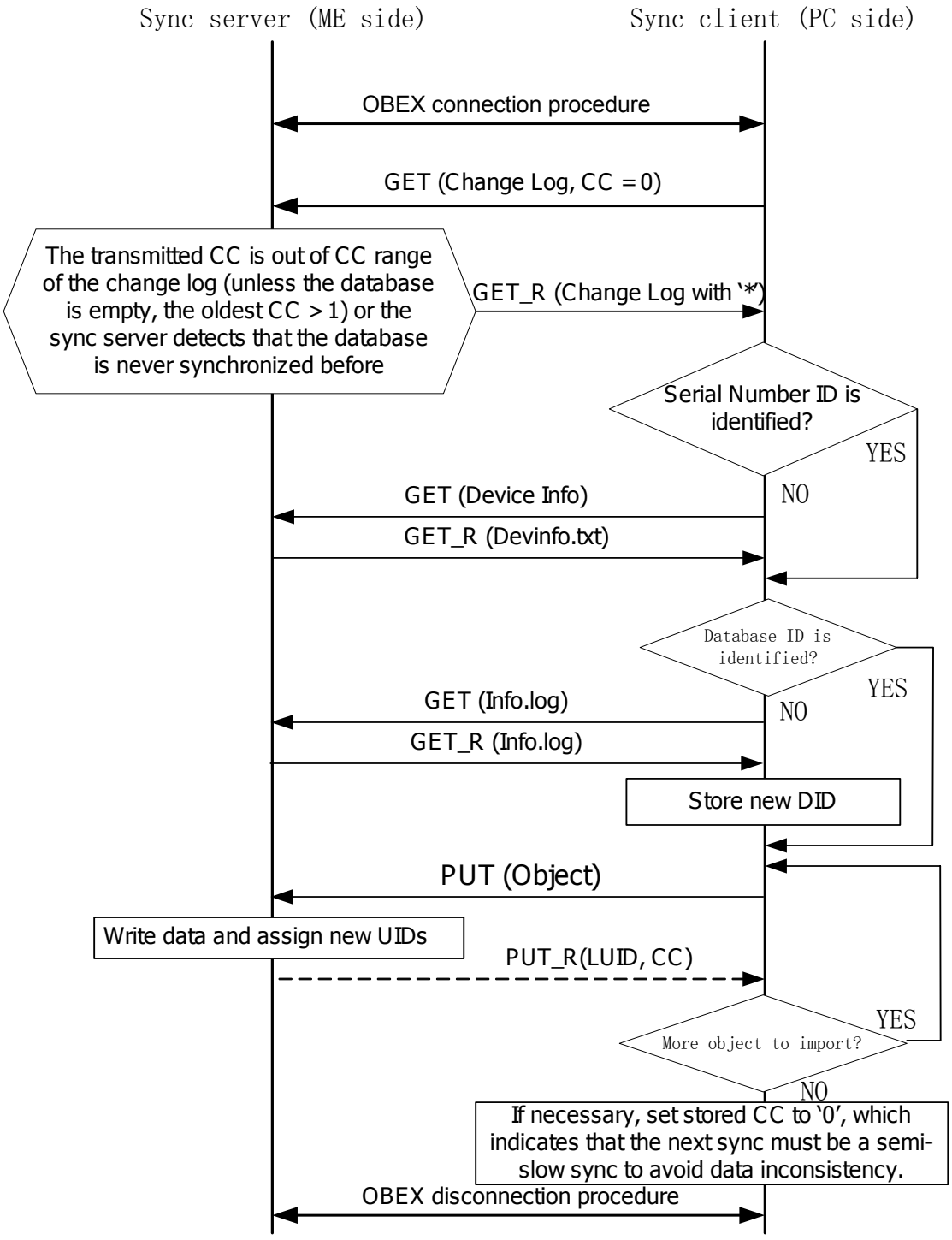


Fig.9 : Import (Merge with old database)

8.7 Identify Mobile Model (Whenever the sync client receives devinfo.txt from the sync server)

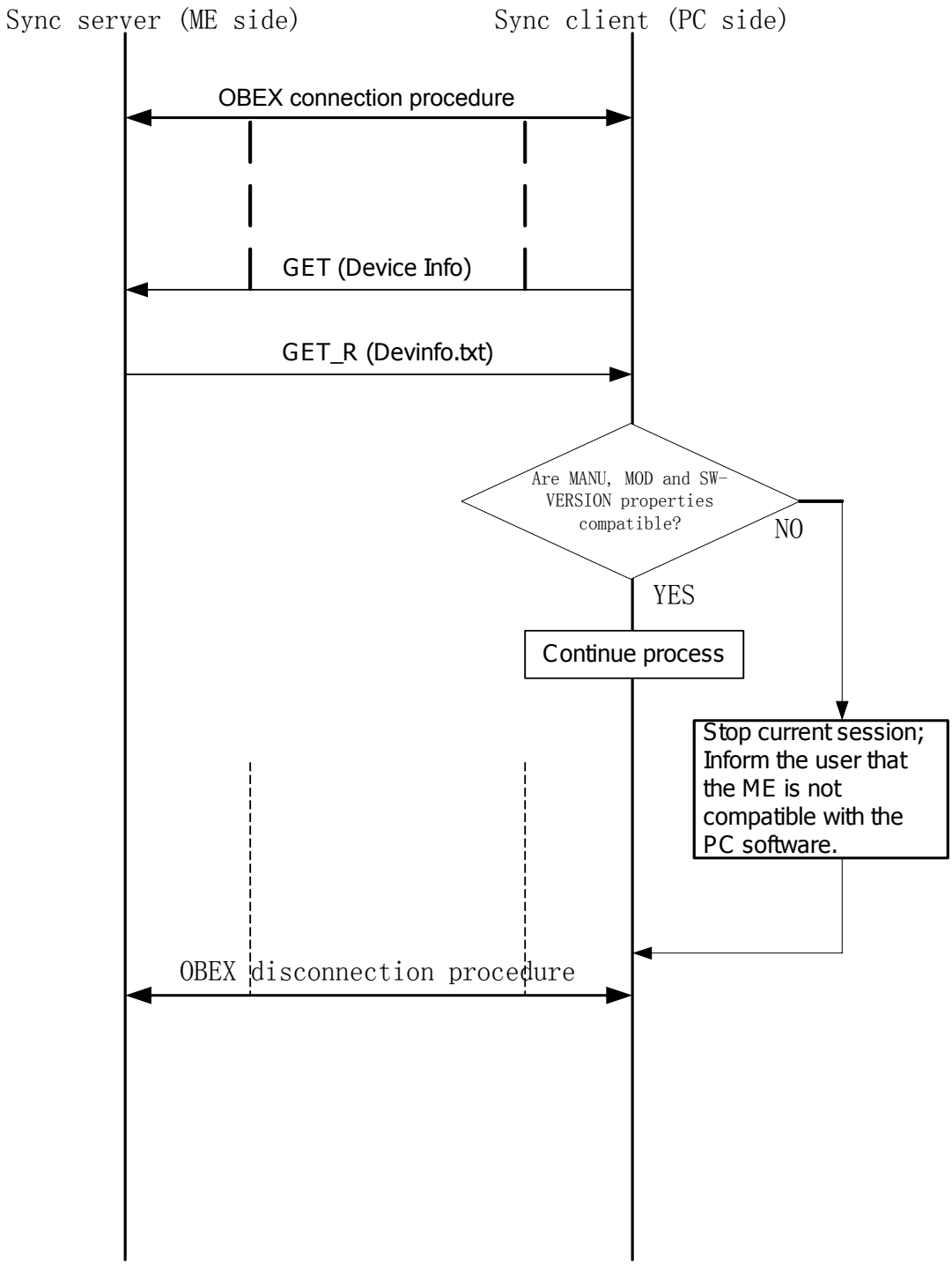


Fig.10: Identify ME

9 Glossary

ME Mobile Entity

MMI Man-Machine Interface

PIM Personal Information Management

UCS2 Unicode Character Set

CC **current Change Counter (per object store)**

Last known CC **the last known Change Counter in the sync client (per object store)**

END OF DOCUMENT