Standard ECMA-313
September 2000

# ECMA

## Standardizing Information and Communication Systems

**Private Integrated Services Network (PISN) -
Specification, Functional Model and Information Flows -
Call Identification and Call Linkage Additional Network Feature**

.

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**Private Integrated Services Network (PISN) -**
**Specification, Functional Model and Information Flows -**
**Call Identification and Call Linkage Additional Network Feature**

**(CIDLSD)**

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## Brief History

This Standard is one of a series of ECMA Standards defining services and signalling procedures applicable to Private Integrated Services Networks (PISNs). The series uses the ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC. It has been produced under ETSI work item DEN/ECMA-00202.

This Standard specifies the Call Identification and Call Linkage (CIDL) additional network feature.

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

There is currently no equivalent service specified by ITU-T or ETSI for public ISDN.

This ECMA Standard is contributed to ISO/IEC JTC1 under the terms of the fast-track procedure, for adoption as an ISO/IEC International Standard.

This ECMA Standard has been adopted by the General Assembly in September 2000.

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# 1 Scope

This Standard specifies the Additional Network Feature (ANF) Call Identification and Call Linkage (CIDL), which is applicable to various basic services supported by Private Integrated Services Networks (PISN). Basic services are specified in ECMA-142.

ANF-CIDL is an additional network feature which allows the identification and correlation of calls throughout a PISN by assigning unambiguous identifiers to each new call and also, as an option, to transformed and logically linked calls.

*NOTE 1*
*This ANF has been developed to support the use of CSTA (ECMA-269) in a networked environment, i.e. in a PISN. Use of this ANF for other applications is not precluded.*

Supplementary service specifications are produced in three stages, according to the method described in ETS 300 387. This Standard contains the stage 1 and stage 2 specifications of ANF-CIDL. The stage 1 specification (clause 6) specifies the general feature principles and capabilities. The stage 2 specification (clause 7) identifies the Functional Entities involved in the supplementary service and the information flows between them.

# 2 Conformance

In order to conform to this Standard, a stage 3 standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary service specified in this Standard. This means that, to claim conformance, a stage 3 standard is required to be adequate for the support of those aspects of clause 6 (stage 1) and clause 7 (stage 2) which are relevant to the interface or equipment to which the stage 3 standard applies.

# 3 References (normative)

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

In the case of references to ECMA Standards that are aligned with ISO/IEC International Standards, the number of the appropriate ISO/IEC International Standard is given in brackets after the ECMA reference.

ECMA-133        Private Integrated Services Network (PISN) - Reference Configuration for PISN Exchanges (PINX) (International Standard ISO/IEC 11579-1)

ECMA-142        Private Integrated Services Network (PISN) - Circuit Mode 64kbit/s Bearer Services - Service Description, Functional Capabilities and Information Flows (International Standard ISO/IEC 11574)

ECMA-155        Private Integrated Services Networks - Addressing (International Standard ISO/IEC 11571)

ECMA-173        Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Diversion Supplementary Services (International Standard ISO/IEC 13872)

ECMA-175        Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Path Replacement Additional Network Feature (International Standard ISO/IEC 13863)

ECMA-177        Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Transfer Supplementary Service (International Standard ISO/IEC 13865)

ECMA-185        Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Completion Supplementary Services (International Standard ISO/IEC 13866)

ECMA-191    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Offer Supplementary Service (International Standard ISO/IEC 14841)

ECMA-193    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Do Not Disturb and Do Not Disturb Override Supplementary Services (International Standard ISO/IEC 14842)

ECMA-202    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Intrusion Supplementary Service (International Standard ISO/IEC 14845)

ECMA-220    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Interception Additional Network Feature (International Standard ISO/IEC 15053)

ECMA-269    Services for Computer Supported Telecommunications Applications (CSTA) Phase III, (International Standard ISO/IEC 18051)

ECMA-281    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Private User Mobility (PUM) - Registration Supplementary Service (International Standard ISO/IEC 17875)

ECMA-283    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Private User Mobility (PUM) - Call Handling Additional Network Features (International Standard ISO/IEC 17877)

ECMA-299    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Single Step Call Transfer Supplementary Service (International Standard ISO/IEC DIS 19459)

ECMA-301    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Wireless Terminal Location Registration Supplementary Service and Wireless Terminal Information Exchange Additional Network Feature (International Standard ISO/IEC 15428)

ECMA-303    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Wireless Terminal Call Handling Additional Network Features (International Standard ISO/IEC 15430)

ECMA-305    Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Wireless Terminal Authentication Supplementary Services (International Standard ISO/IEC 15432)

ETS 300 387    Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services (1994)

ITU-T Rec. I.112    Vocabulary of terms for ISDN (1993)

ITU-T Rec. I.210    Principles of telecommunication services supported by an ISDN and the means to describe them (1993)

ITU-T Rec. Z.100    Specification and description language (1993)

# 4    Definitions

For the purposes of this Standard the following definitions apply.

## 4.1    External definitions

This Standard uses the following terms defined in other documents:

−    Basic service                                                    (ITU-T Rec. I.210)

−    PISN Number                                                    (ECMA-155)

−    Private Integrated Services Network (PISN)                        (ECMA-133)

–   Private Integrated Services Network Exchange (PINX)        (ECMA-133)

–   Service        (ITU-T Rec. I.112)

–   Signalling        (ITU-T Rec. I.112)

–   Supplementary Service        (ITU-T Rec. I.210)

–   User        (ECMA-142)

This Standard refers to the following basic call Functional Entities (FE) defined in ECMA-142:

–   Call Control (CC)

–   Call Control Agent (CCA)

This Standard refers to the following basic call inter-FE relationships defined in ECMA-142:

–   r1

–   r2

–   r3

This Standard refers to the following basic call information flows defined in ECMA-142:

–   SETUP request/indication

## 4.2   Additional Network Feature (ANF)

A capability over and above that of the basic service provided by a PISN, but not directly to a user.

## 4.3   ANF-CIDL user

An entity, within a PISN, that requests ANF-CIDL.

## 4.4   Call

The term call is used within this Standard for a Basic Call as defined in ECMA-142 or a Call Independent Signalling Connection.

## 4.5   Call Identification Data, CIDL-Data

The Leg ID and Call Linkage Data assigned to a specific call.

## 4.6   Call Linkage Data

The Global Call ID and Thread ID assigned to a specific call, as specified in ECMA-269.

## 4.7   Global Call Identification, Global Call ID, GID

A value assigned to a call end-to-end to uniquely identify that call throughout the PISN, without regards to its route or its history. If different calls are being transformed into a new call (i.e. due to Supplementary Service / ANF interaction), the GIDs of the old calls are updated (i.e. replaced / overwritten) with a new GID value for the new call.

## 4.8   Leg Identification, Leg ID, LID

A value assigned to a new call to uniquely identify that call throughout the PISN. The Leg ID does not change (i.e. is never overwritten) during the lifetime of the call, even if the call is transformed due to Supplementary Service / ANF interactions. After the transformation of two or more calls with different Leg IDs into one resulting call (e.g. after call transfer), the different parts (legs) of the resulting call retain their originally assigned Leg IDs.

## 4.9   Thread Identification, Thread ID, TID

A value assigned to calls which are logically linked together for the purpose of correlating them throughout the PISN. If two ore more calls are logically linked together (i.e. due to Supplementary Service / ANF interaction), the Thread IDs of all these calls are updated (i.e. replaced / overwritten) with the current Thread ID of one of these calls.

# 5    List of acronyms

| | |
|---|---|
| ANF | Additional Network Feature |
| ANF-CIDL | ANF – Call Identification and Call Linkage |
| CC | Call Control (Functional Entity) |
| CCA | Call Control Agent (Functional Entity) |
| FE | Functional Entity |
| GID | Global Call Identification |
| CIDL | Call Identification and Call Linkage |
| ID | Identification |
| ISDN | Integrated Services Digital Network |
| LID | Leg Identification |
| PINX | Private Integrated Services Network Exchange |
| PISN | Private Integrated Services Network |
| SDL | Specification and Description Language |
| SS | Supplementary Service |
| TID | Thread Identification |

# 6    ANF-CIDL stage 1 specification

## 6.1    Description

### 6.1.1    General description

ANF-CIDL is an additional network feature which allows the assignment of a Global Call Identification to identify a call end-to-end. As an option, a Thread Identification may be assigned to different calls which are logically linked together due to the operation of other supplementary services and/or ANFs. Additionally a Leg Identification may be assigned, to identify the different call legs of a global call.

### 6.1.2    Qualifications on applicability to telecommunication services

ANF-CIDL is applicable to all basic services defined in ECMA-142.

## 6.2    Procedure

### 6.2.1    Provision/withdrawal

ANF-CIDL shall be generally available throughout the PISN.

### 6.2.2    Normal procedures

#### 6.2.2.1    Activation, deactivation and interrogation

The feature shall be permanently activated.

#### 6.2.2.2    Invocation and operation

A Global Call ID shall be assigned to each new call that is set up. Due to transformation of a call, the Global Call ID may be updated. At one time there can only be one Global Call ID assigned to a specific call. Once a Global Call ID is assigned, it shall not be re-used, even not after the call, to which it is assigned, has been cleared.

Optionally, a Thread ID may be assigned to each new call that is set up. It may be updated during the lifetime of a call. At one time there can only be one Thread ID assigned to a specific call. Once a Thread ID is assigned, it shall not be re-used, even not after the call, to which it is assigned, has been cleared.

*NOTE 2*
*This is guaranteed by adding a time element to the Global Call ID and the Thread ID.*

Optionally, a Leg ID may be assigned to each new call that is set up. Due to supplementary service / ANF interactions, different Leg IDs may be assigned to the different parts of a transformed call. At one time there can only be one Leg ID assigned to a specific part of a call. After the call has been cleared, the Leg ID shall be available for re-use.

### 6.2.3 Exceptional procedures

### 6.2.3.1 Activation, deactivation, and interrogation

Not applicable.

### 6.2.3.2 Invocation and operation

When both sides of a call simultaneously attempt to update a Global Call ID or a Thread ID assigned to that call, the GID / TID with the higher value shall take precedence.

## 6.3 Interaction with other supplementary services and ANFs

Interactions with other supplementary services and ANFs for which PISN standards were available at the time of publication of this Standard are specified below.

For the purpose of the Leg ID no interactions with other supplementary services apply, as it shall be unique for each new call. All interactions described in this sub-clause apply only to the Global Call ID and / or the Thread ID.

If no interactions for the Global Call ID / Thread ID are mentioned, these values shall not be updated.

If not otherwise stated, the values for Global Call ID / Thread ID shall be updated for a call, at the same time the specific Supplementary Service / ANF is completed.

### 6.3.1 Calling Line Identification Presentation (SS-CLIP)

No interaction.

### 6.3.2 Connected Line Identification Presentation (SS-COLP)

No interaction.

### 6.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

No interaction

### 6.3.4 Calling Name Identification Presentation (SS-CNIP)

No interaction.

### 6.3.5 Calling Name Identification Restriction (SS-CNIR)

No interaction.

### 6.3.6 Connected Name Identification Presentation (SS-CONP)

No interaction.

### 6.3.7 Completion of Call to Busy Subscriber (SS-CCBS)

The Thread ID of the unsuccessful call attempt shall be assigned to

- the connection used to invoke CCBS; and

- the call attempt used to complete the call; and

- the connection used to indicate that User B has become not busy in case the connection release option was chosen.

New and different Global Call IDs and also new and different Leg IDs shall be assigned to these calls.

### 6.3.8 Completion of Call on No Reply (SS-CCNR)

6.3.7 shall apply accordingly for SS-CCNR.

### 6.3.9 Call Transfer (SS-CT)

The resulting call shall be updated with a new Global Call ID.

The resulting call shall be updated with the Thread ID of the primary call if

⇒ the primary call is an incoming call and the secondary call is an outgoing call; or

⇒ both calls are incoming calls and the primary call has been established before the secondary call; or

⇒ both calls are outgoing calls and the primary call has been established before the secondary call.

The resulting call shall be updated with the Thread ID of the secondary call if

⇒ the secondary call is an incoming call and the primary call is an outgoing call; or

⇒ both calls are incoming calls and the secondary call has been established before the primary call; or

⇒ both calls are outgoing calls and the secondary call has been established before the primary call.

The Leg IDs of the primary and the secondary call shall not be changed due to SS-CT invocation.

### 6.3.10  Call Forwarding Unconditional (SS-CFU)

The Global Call ID and Thread ID of the call from the calling user to the diverting user and a new Leg ID shall be assigned to the call from the calling user to the diverted-to user.

### 6.3.11  Call Forwarding Busy (SS-CFB)

6.3.10 shall apply.

### 6.3.12  Call Forwarding No Reply (SS-CFNR)

6.3.10 shall apply.

### 6.3.13  Call Deflection (SS-CD)

6.3.10 shall apply.

### 6.3.14  Path Replacement (ANF-PR)

The Global Call ID and the Thread ID of the old connection but a new Leg ID shall be assigned to the new connection.

### 6.3.15  Call Offer (SS-CO)

The call between the called user and a third user may be updated with the Thread ID of the call from the calling user.

#### 6.3.15.1  Without Path Retention

The Thread ID of the failed call shall be assigned to the call requesting Call Offering.

#### 6.3.15.2  With Path Retention

No interaction.

### 6.3.16  Call Intrusion (SS-CI)

In case of a Conference type connection between the served user, the wanted user and the unwanted user, the resulting call shall be updated with the same new Global Call ID. The Thread ID shall be updated in the same way as described in 6.3 for the Conference service (see ECMA-269).

If the unwanted user is isolated, the call between the wanted user and the unwanted user may be updated with the Thread ID of the intruding call.

#### 6.3.16.1  Without Path Retention

The Thread ID of the failed call shall be assigned to the call requesting Call Intrusion.

#### 6.3.16.2  With Path Retention

No interaction.

### 6.3.17  Do not Disturb (SS-DND)

No interaction.

### 6.3.18 Do not Disturb Override (SS-DNDO)

#### 6.3.18.1 Without Path Retention

The Thread ID of the failed call shall be assigned to the call requesting Do not Disturb Override.

#### 6.3.18.2 With Path Retention

No interaction.

### 6.3.19 Advice of Charge (SS-AOC)

No interaction.

### 6.3.20 Recall (SS-RE)

No interaction.

### 6.3.21 Call Interception (ANF-CINT)

The Global Call ID and Thread ID of the call from the calling user to the called user and a new Leg ID shall be assigned to the call from the calling user to the intercepted-to user.

### 6.3.22 Transit Counter (ANF-TC)

No interaction.

### 6.3.23 Route Restriction Class (ANF-RRC)

No interaction.

### 6.3.24 Message Waiting Indication (SS-MWI)

No interaction.

### 6.3.25 Wireless Terminal Location Registration (SS-WTLR)

In case of automatic de-registration of a WTM user due to a new registration, the Thread ID of the registration call shall be assigned to the de-registration call.

In case of an enquiry call prior to the registration call, the Thread ID of the enquiry call shall be assigned to the registration call.

### 6.3.26 Wireless Terminal Incoming Call (ANF-WTMI)

The Global Call ID and Thread ID of the incoming call and a new Leg ID shall be assigned to the call to the WTM user.

In case of an enquiry call, the Thread ID of the incoming call shall be assigned to the enquiry call.

### 6.3.27 Wireless Terminal Outgoing Call (ANF-WTMO)

The Global Call ID and Thread ID of the call to the home address and a new Leg ID shall be assigned to the call to the called user.

### 6.3.28 Wireless Terminal Authentication of a WTM User (SS-WTAT)

In case of an enquiry call, the Thread ID of the enquiry call shall be assigned to the authentication call.

### 6.3.29 Wireless Terminal Authentication of the PISN (SS-WTAN)

No interaction.

### 6.3.30 Private User Mobility Incoming Call (ANF-PUMI)

The Global Call ID and Thread ID of the incoming call and a new Leg ID shall be assigned to the call to the PUM user.

In case of an enquiry call, the Thread ID of the incoming call shall be assigned to the enquiry call.

### 6.3.31 Private User Mobility Outgoing Call (ANF-PUMO)

The Global Call ID and Thread ID of the call to the home address and a new Leg ID shall be assigned to the call to the called user.

### 6.3.32 Private User Mobility Registration (SS-PUMR)

In case of automatic de-registration of a PUM user due to a new registration, the Thread ID of the registration call shall be assigned to the de-registration call.

In case of an enquiry call prior to the registration call, the Thread ID of the enquiry call shall be assigned to the registration call.

In case of remote registration, the Thread ID of the registration call shall be assigned to the call from the remote address.

### 6.3.33 Common Information (ANF-CMN)

No interaction.

### 6.3.34 Call Priority Interruption (Protection) (SS-CPI(P))

No interaction.

### 6.3.35 Single Step Call Transfer (SSCT)

The Thread ID of the call to the transferring user shall be assigned to the call to the transferred-to user.

A new Global Call ID shall be assigned to the resulting call between the transferred user and the transferred-to user.

### 6.3.36 Other interactions

A consultation call, as defined in ECMA-269, shall be assigned the same Thread ID as the call being put on hold.

Upon initiation of a conference, as defined in ECMA-269, all calls within the conference shall be updated with the same new Global Call ID. The Thread ID for the conferenced calls shall be updated in the following way:

- if exactly one of the conferenced calls was an incoming call, the Thread ID for the linked calls shall be the same as for the incoming call;

- if several of the calls were incoming calls, the Thread ID for the linked calls shall be the same as for the first incoming call;

- if all calls are outgoing calls, the Thread ID for the linked calls shall be the same as for the first established call.

Upon adding a user to an already existing conference, the call to the new conference member and all calls within the conference shall be updated with the same new Global Call ID. The call to the new conference member shall be updated with the Thread ID which is assigned to the other calls in the conference.

## 6.4 Interworking considerations

As no similar service exists for public ISDN, ANF-CIDL shall be terminated at the boundaries of the PISN.

## 6.5 Overall SDL

Figure 1 contains the dynamic description of ANF-CIDL using the Specification and Description Language (SDL) defined in ITU-T Rec. Z.100 (1993). The SDL process represents the behaviour of the PISN in providing ANF-CIDL.

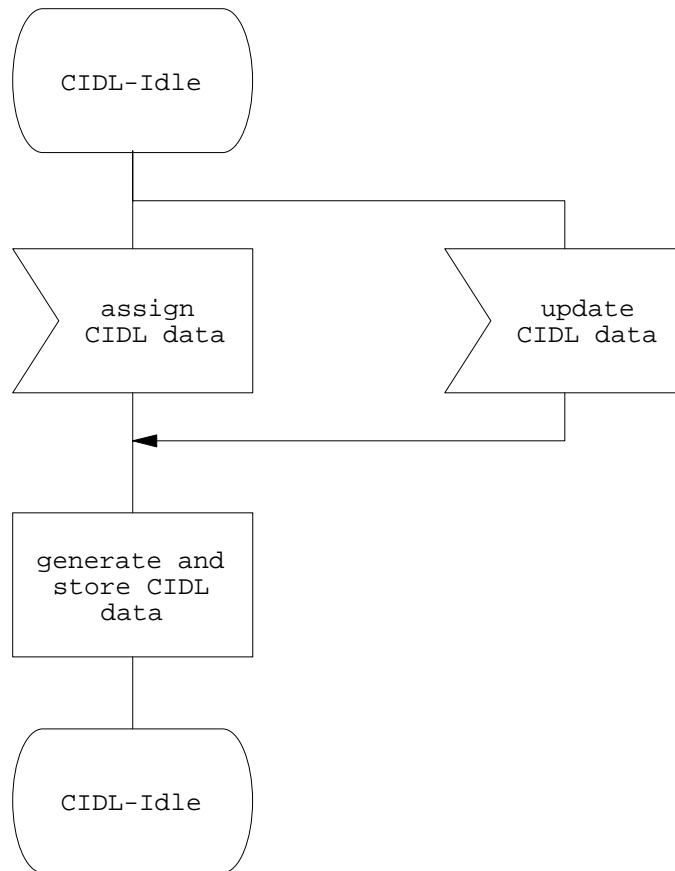Input signals from the left represent primitives from the ANF-CIDL user.

```
     ┌─────────────────┐
     │                 │
     │    CIDL-Idle    │
     │                 │
     └────────┬────────┘
              │
       ┌──────┴──────────────────────────┐
       │                                  │
  ╲────┴─────╲                       ╲────┴─────╲
   ╲  assign  │                       ╲  update  │
   ╱ CIDL data│                       ╱ CIDL data│
  ╱───────────╱                       ╱──────────╱
       │                                  │
       ◄──────────────────────────────────┘
       │
  ┌────┴──────────┐
  │ generate and  │
  │  store CIDL   │
  │     data      │
  └────┬──────────┘
       │
  ┌────┴────────────┐
  │                 │
  │    CIDL-Idle    │
  │                 │
  └─────────────────┘
```

**Figure 1 - ANF-CIDL, Overall SDL**

## 7     ANF-CIDL stage 2 specification

A stage 3 standard for ANF-CIDL shall be capable of supporting the functional breakdown of the service specified in this clause.

### 7.1     Functional model

#### 7.1.1     Functional model description

The functional model shall comprise the following Functional Entities:

FE1          Calling Service Control

FE2          Transit Service Control

FE3          Called Service Control

The following functional relationships shall exist between these FEs:

ra           between FE1 and FE2, between FE2 and FE3 or between FE1 and FE3

Figure 2 shows these FEs and relationships.

```
┌─────┐          ┌─────┐          ┌─────┐
│ FE1 ├──ra──────┤ FE2 ├──ra──────┤ FE3 │
└─────┘          └─────┘          └─────┘
```

**Figure 2 - Functional model of ANF-CIDL**

### 7.1.2 Description of functional entities

#### 7.1.2.1 Calling Service Control, FE1

This FE

- generates, upon an internal request, call identification data for a new call and sends it in an assign request to FE2 or FE3;

- receives an update request for call identification data from FE2 or FE3;

- generates, upon an internal request, call identification data for a call and sends it in an update request to FE2 or FE3.

#### 7.1.2.2 Transit Service Control, FE2

This FE

- receives an assign request for call identification data for a new call from FE1 and sends it on in an assign request to FE3;

- receives an update request for call identification data from FE1 and sends it on in an update request to FE3;

- receives an update request for call identification data from FE3 and sends it on in an update request to FE1.

#### 7.1.2.3 Called Service Control, FE3

This FE

- receives an assign request for call identification data for a new call from FE1 or FE2;

- receives an update request for call identification data from FE1 or FE2;

- generates, upon an internal request, call identification data for a call and sends it in an update request to FE1 or FE2.

### 7.1.3 Example relationship of functional model to Basic Call functional model

Functional Entity FE1 shall be collocated with the originating CC.

Functional Entity FE2 shall be collocated with the transit CC.

Functional Entity FE3 shall be collocated with the destination CC.

An example of a relationship between the FEs for ANF-CIDL and FEs for the basic call is shown in figure 3.
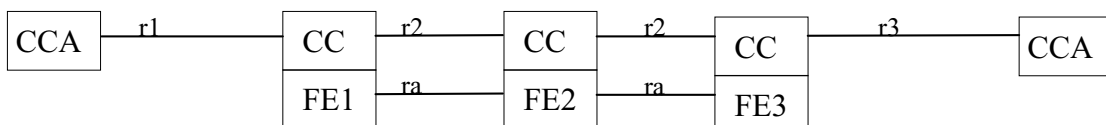
```
┌─────┐       ┌─────┐      ┌─────┐       ┌─────┐        ┌─────┐
│ CCA ├──r1───┤ CC  ├──r2──┤ CC  ├──r2───┤ CC  ├───r3───┤ CCA │
└─────┘       ├─────┤      ├─────┤       ├─────┤        └─────┘
              │ FE1 ├──ra──┤ FE2 ├──ra───┤ FE3 │
              └─────┘      └─────┘       └─────┘
```

**Figure 3 - Example Relationship between Model for ANF-CIDL and Basic Call**

## 7.2 Information flows

### 7.2.1 Definition of information flows

In the tables listing the elements in information flows, the column headed "Request" indicates which of these elements are mandatory (M) and which are optional (O) in a request/indication information flow.

#### 7.2.1.1 Assign

This is an unconfirmed information flow across ra from FE1 to FE2 or from FE2 to FE3 or from FE1 to FE3 which is associated with a "basic call" Setup Information flow in call related case. It can also be used independent of a basic call. It assigns call identification data to a new call.

Table 1 lists the service elements within the Assign information flow.

**Table 1 - Content of Assign**

| Service element | Request |
|---|---|
| Global Call Identification | M |
| Thread Identification | O |
| Leg Identification | O |

Service element Global Call Identification shall contain the Global Call ID for he particular call as it has been generated and stored in FE1.

Service element Thread Identification if present shall contain the Thread ID for the particular call as it has been generated and stored in FE1.

Service element Leg Identification if present shall contain the Leg ID for the particular call as it has been generated and stored in FE1.

#### 7.2.1.2 Update

This is an unconfirmed information flow across ra either from FE1 to FE2 or from FE2 to FE3 or from FE1 to FE3 or from FE3 to FE2 or from FE2 to FE1 or from FE3 to FE1. It updates call identification data for an already existing call.

Table 2 lists the service elements within the Update information flow.

**Table 2 - Content of Update**

| Service element | Request |
|---|---|
| Global Call Identification | O |
| Thread Identification | O |
| Leg Identification | O |

Service element Global Call Identification if present shall contain the Global Call ID for the particular call as it has been generated and stored in FE1/FE3.

Service element Thread Identification if present shall contain the Thread ID for the particular call as it has been generated and stored in FE1/FE3.

Service element Leg Identification may contain the Leg ID for the particular call as it has been generated and stored in FE1/FE3.

### 7.2.2 Examples of information flow sequences

Below are examples of typical sequences of information flows. In addition to providing signalling procedures in support of these sequences, a stage 3 standard shall also cover other sequences arising from error situations, interactions with basic call, interactions with other supplementary services, different topologies, etc.

In the figures, ANF-CIDL information flows are represented by solid arrows and basic call information flows are represented by broken arrows. An ellipse embracing two information flows indicates that the two information flows occur simultaneously. Within a column representing an ANF-CIDL functional entity, the numbers refer to functional entity actions listed in 7.3.

**7.2.2.1  Successful CIDL assignment to a new call**

Figure 4 shows the information flow sequence for normal operation of ANF-CIDL upon successful assignment for call identification data to a new call.
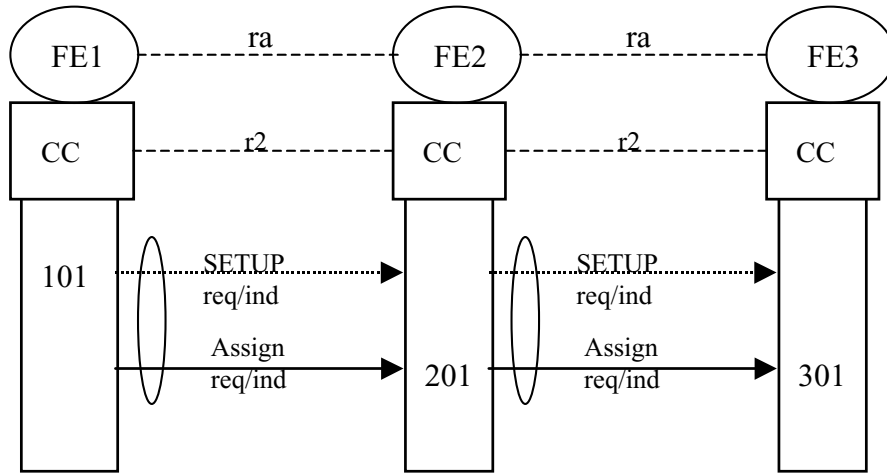


**Figure 4 - Information Flow Sequence - Normal Operation of ANF-CIDL, assignment of call identification data for a new call**

**7.2.2.2  Successful CIDL, update of call identification data, initiated by FE1**

Figure 5 shows the information flow sequence for normal operation of ANF-CIDL when the call identification data for a already existing call is being updated due to a request from FE1.
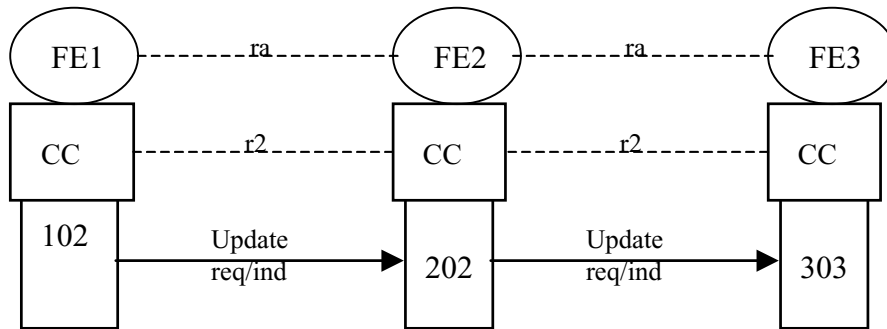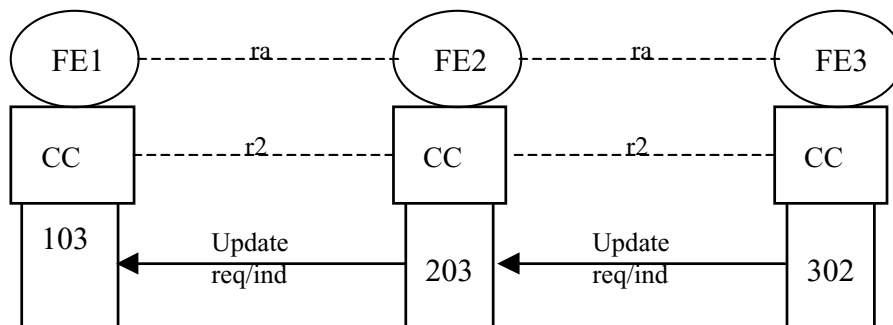


**Figure 5 - Information Flow Sequence - Normal Operation of ANF-CIDL, update of call identification data initiated by FE1**

**7.2.2.3** **Successful CIDL, update of call identification data, initiated by FE3**

Figure 6 shows the information flow sequence for normal operation of ANF-CIDL when the call identification data for a already existing call is being updated due to a request from FE3.



**Figure 6 - Information Flow Sequence - Normal Operation of ANF-CIDL, update of call identification data initiated by FE3**

## 7.3 Functional Entity actions

The following FE actions shall occur at the points indicated in the figures of 7.2.2.

### 7.3.1 Functional Entity actions of FE1

101    Generate call identification data for a new call and send it in Assign req/ind to FE2 or FE3.

102    Generate new call information data and send it in Update req/ind to FE2 or FE3.

103    Receive Update req/ind from FE2 or FE3 and store received call information data.

### 7.3.2 Functional Entity actions of FE2

201    Receive Assign req/ind from FE1 and send it in Assign req/ind to FE3.

202    Receive Update req/ind from FE1 and send it in Update req/ind to FE3.

203    Receive Update req/ind from FE3 and send it in Update req/ind to FE1.

### 7.3.3 Functional Entity actions of FE3

301    Receive Assign req/ind from FE1 or FE2 and store received call information data.

302    Generate new call information data and send it in Update req/ind to FE1 or FE2.

303    Receive Update req/ind from FE1 or FE2 and store received call information data.

## 7.4 Functional Entity behaviour

The FE behaviours shown below are intended to illustrate typical FE behaviour in terms of information flows sent and received.

The behaviour of each FE is shown using the Specification and Description Language (SDL) defined in ITU-T Rec. Z.100.

### 7.4.1 Behaviour of FE1

Figure 7 shows the normal behaviour of FE1. Input signals from the left and output signals to the left represent primitives from and to the ANF-CIDL user. Input signals from the right and output signals to the right represent information flows from and to FE2 and FE3.
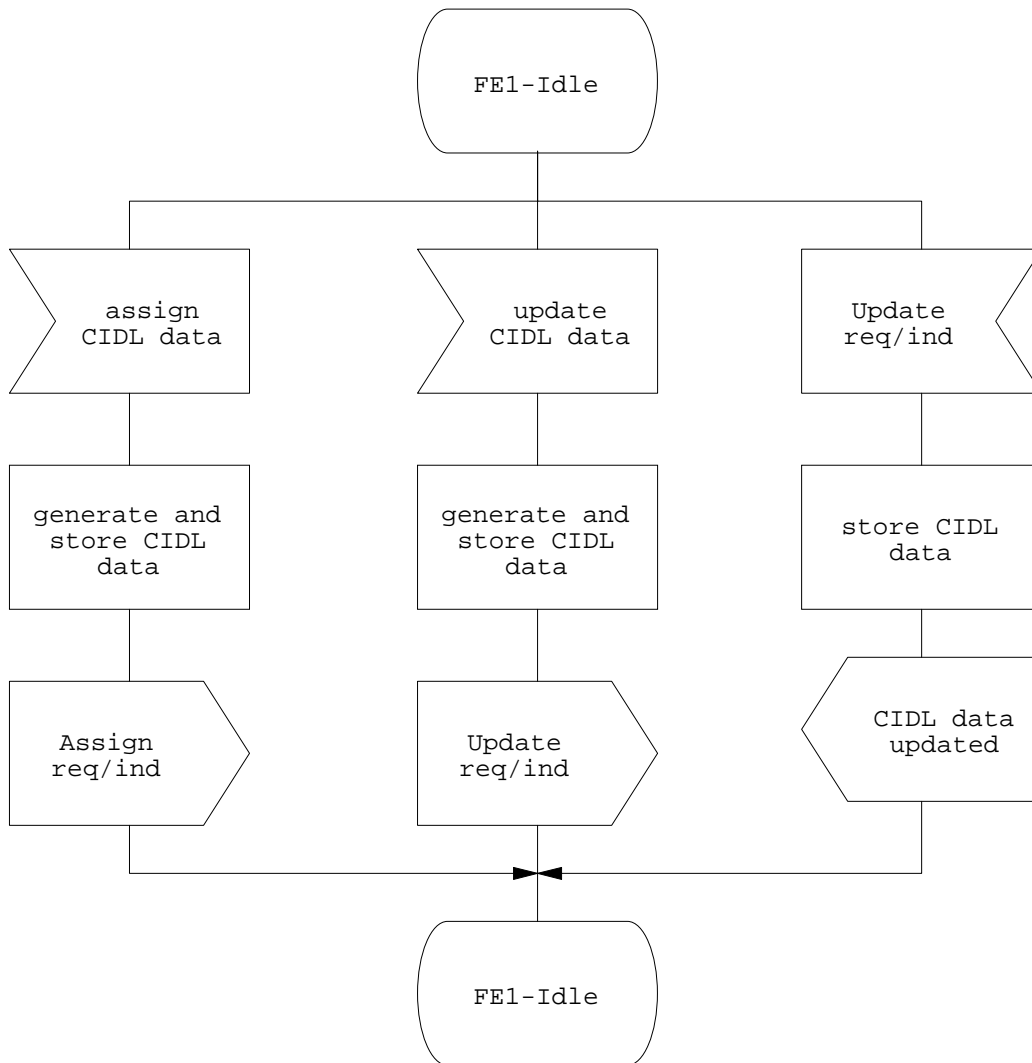


**Figure 7 – ANF-CIDL, SDL for Functional Entity 1**

**7.4.2    Behaviour of FE2**

Figure 8 shows the normal behaviour of FE2. Output signals to the right represent primitives to the ANF-CIDL user. Input signals from the left and output signals to the left represent information flows from and to FE1 and FE3.
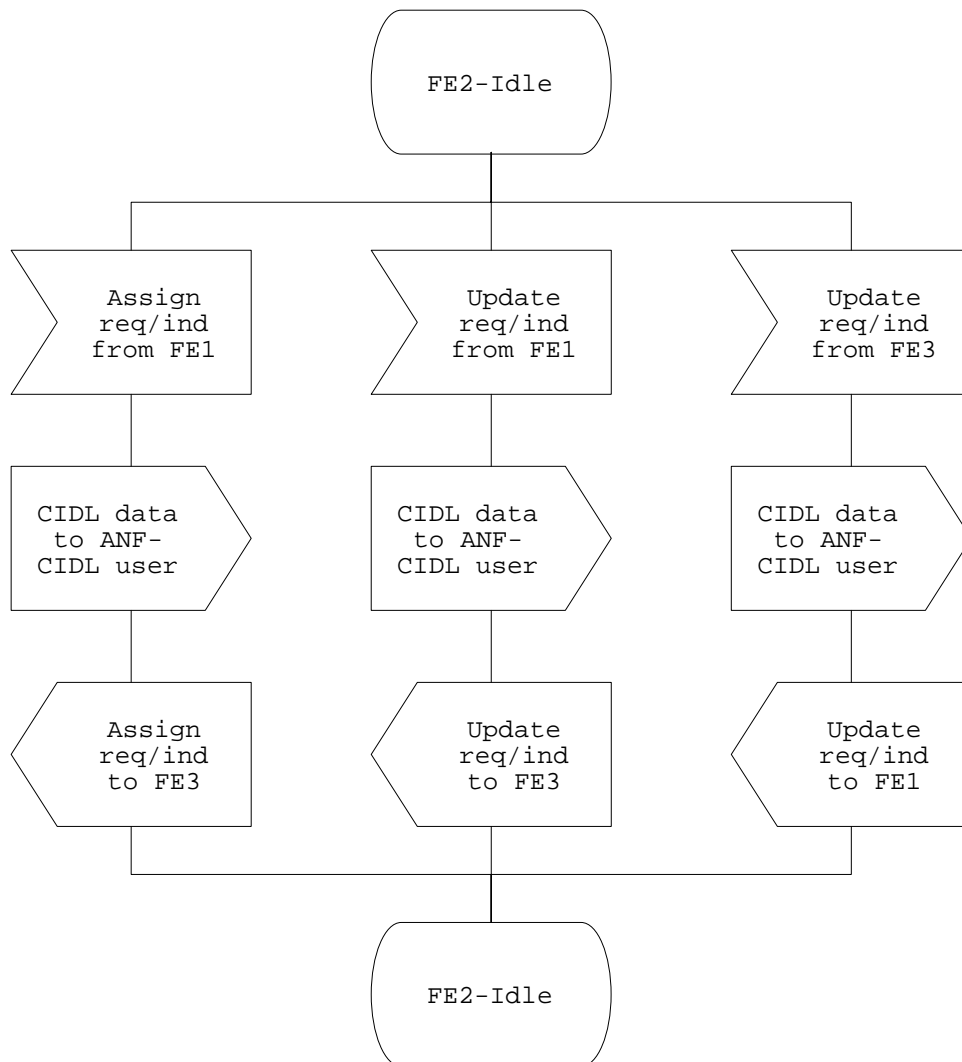


**Figure 8 – ANF-CIDL, SDL for Functional Entity 2**

### 7.4.3 Behaviour of FE3

Figure 9 shows the normal behaviour of FE3. Input signals from the right and output signals to the right represent primitives from and to the ANF-CIDL user. Input signals from the left and output signals to the left represent information flows from and to FE1 and F2.
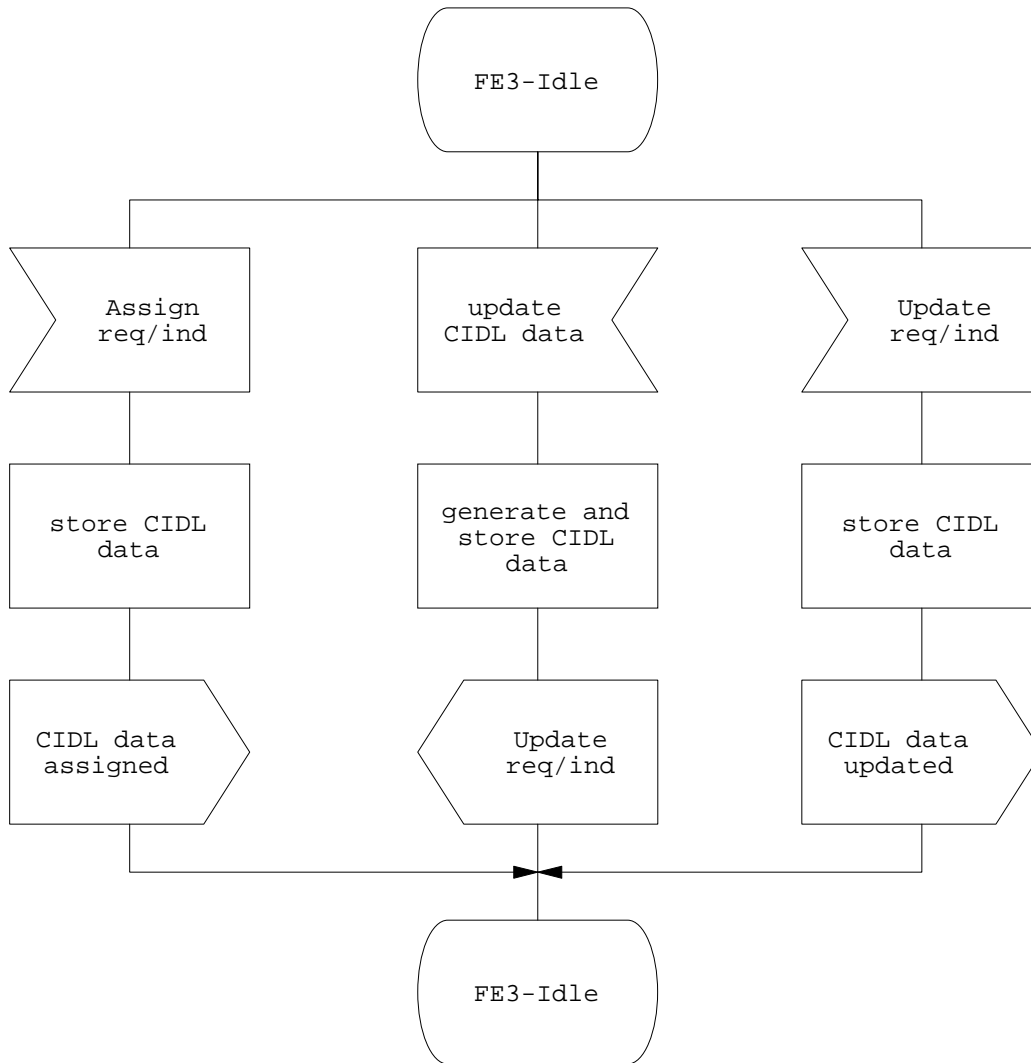


**Figure 9 – ANF-CIDL, SDL for Functional Entity 3**

**7.5     Allocation of Functional Entities to physical equipment**

The allocation of FEs to physical locations as shown in table 3 shall apply.

**Table 3 - Scenarios for the allocation of FEs to physical equipment**

|  | **FE1** | **FE2** | **FE3** |
|---|---|---|---|
| Scenario 1 | Originating PINX | Transit PINX | Terminating PINX |
| Scenario 2 | Incoming Gateway PINX | Transit PINX | Terminating PINX |
| Scenario 3 | Originating PINX | Transit PINX | Outgoing Gateway PINX |
| Scenario 4 | Originating PINX | Transit PINX | PINX invoking Supplementary Service / ANF |
| Scenario 5 | Incoming Gateway PINX | Transit PINX | PINX invoking Supplementary Service / ANF |

Additional scenarios 6 to 10 are existing and are similar to scenarios 1 to 5 but without any allocation of FE2 to physical equipment, i.e. FE2 is absent.

**7.6     Interworking considerations**

When interworking with another network which does not support an equivalent feature, the FEs for ANF-CIDL shall be located within PINXs, in accordance with 7.5. All information flows will be internal to the PISN.

When interworking with another network which supports an equivalent feature, the two networks may cooperate in the operation of ANF-CIDL. In this case, either FE1 or FE3 will be located in the other network and the information flows within the PISN will map on to equivalent information flows in the other network.