DRAFT

EUROPEAN TELECOMMUNICATION STANDARD

pr **ETS 300 392-12-22**

September 1996

Source: ETSI TC-RES

Reference: DE/RES-06001-12-22

ICS: 33.060, 33.060.50

Key words: TETRA, V+D, SS, DGNA

Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary Services (SS) Stage 3; Part 12-22: Dynamic Group Number Assignment (DGNA)

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

Contents

Blank page

Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is a multi-part standard and will consist of the following parts:

Part 1: "General network design".

Part 2: "Air Interface (AI)".

Part 3: "Inter-working", (DE/RES-06001-3).

Part 4: "Gateways", (DE/RES-06001-4).

Part 5: "Terminal equipment interface", (DE/RES-06001-5).

Part 6: "Line connected stations", (DE/RES-06001-6).

Part 7: "Security".

Part 8: "Management services", (DE/RES-06001-8).

Part 9: "Performance objectives", (DE/RES-06001-9).

Part 10: "Supplementary Services (SS) Stage 1".

Part 11: "Supplementary Services (SS) Stage 2".

Part 12: "Supplementary Services (SS) Stage 3".

Part 13: "SDL Model of the Air Interface".

Part 14: "PICS Proforma", (DE/RES-06001-14).

Part 15: "Inter-working - Extended Operations", (DE/RES-06001-15).

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

Blank page

1 Scope

This European Telecommunication Standard (ETS) defines the stage 3 specifications of the Supplementary Service Dynamic Group Number Assignment (SS-DGNA) for the Trans-European Trunked Radio (TETRA).

The SS-DGNA enables a user to dynamically define group identities and group related parameters to the TETRA system and to the subscribers in the system. These definitions are used to enable group call invocations to dynamically defined groups. The SS-DGNA specification defines the creation, modification, deletion and interrogation of group definitions in the Switching and Management Infrastructure (SwMI), in the Mobile Station (MS) and in the Line Station (LS).

This specification does not include the specification for access priority used for random access in uplink and call priority used by SwMI for resource allocation in a group call. Access priority and call priority can be specified and applied for groups using Supplementary Services Access Priority (SS-AP), Priority Call (SS-PC) and Pre-emptive Priority Call (SS-PPC). Thus, the definition procedure of these priorities is outside the scope of this ETS.

Man-Machine Interface (MMI) and charging principles are also outside the scope of this ETS.

Supplementary service stage 3 specification is preceded by the stage 1 and the stage 2 specifications of the service. Stage 1 describes the functional capabilities from the user's point of view. Stage 2 defines the functional behaviour in terms of functional entities and information flows. Stage 3 gives the precise description of the supplementary service from the implementational point of view. It defines the protocols for the service and the encoding rules for the information flows. It defines the processes for the functional entities and their behaviour. The described protocols and their behaviour apply for the SwMI, for the MS and for the LS and can be applied over the Inter-System Interface (ISI) between TETRA systems.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[2] ISO 8859-1: "Graphic character sets".

[3] ETS 300 392-11-9: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary Services (SS) Stage 2; Part 11-9: Access Priority (AP)".

[4] ETS 300 392-2: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

[5] ETS 300 392-1: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design".

[6] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

[7] ETS 300 392-7: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA); Voice plus Data (V+D); Part 7: Security".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

affected user: An identified MS or LS user to whom the service is assigned.

authorized user: A user who is able to define, cancel, delete and interrogate SS-DGNA on numbers he is authorized to.

bearer service: A type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces.

call related DGNA: Creation of a group based on the participants of a referenced call.

call unrelated DGNA: Creation of a group based on identities.

DGNA number: Group number added, modified, deleted and/or interrogated with SS-DGNA.

Mobile Station (MS): A physical grouping that contains all of the mobile equipment that is used to obtain TETRA services. By definition, a mobile station contains at least one Mobile Radio Stack (MRS).

provision: The act of supplying a given service.

supplementary service: A supplementary service modifies or supplements a bearer service or a teleservice. A supplementary service cannot be offered to a customer as a stand alone service. It should be offered in combination with a bearer service or a teleservice.

Switching and Management Infrastructure (SwMI): All of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals. The SwMI enables subscriber terminals to communicate with each other via the SwMI.

teleservice: A type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AP	Access Priority
CC	Call Control
CCA	Call Control (functional entity Agent)
CMCE	Circuit Mode Control Entity
CONP	Connection Oriented Network Protocol
DGNA	Dynamic Group Number Assignment
FE	Functional entity
GTSI	Group TETRA Subscriber Identity
ISI	Inter System Interface
ITSI	Individual TETRA Subscriber Identity
MLE	Mobile Link Entity
MM	Mobility Management
PC	Priority Call
PPC	Pre-emptive Priority Call
SCNLP	Specific Connectionless Network Layer Protocol
SDS	Short Data Service
SNA	Short Number Addressing
SSI	Short Subscriber Identity
SS	Supplementary Service

NOTE: The abbreviation SS is only used when referring to a specific supplementary service.

SwMI Switching and Management Infrastructure

4 SS-DGNA Stage 2 specification

4.1 Functional model

4.1.1 Functional model description

The functional model shall comprise the following Functional entities (FEs):

- FE1 affected user's agent for assignment, deassignment and interrogation;
- FE2 Dynamic group number assignment functional entity in system 1;
- FE3 authorized user's definition, deletion cancellation and interrogation agent;
- FE4 Generic Dynamic group number assignment functional entity in system 2;
- CC Call Control (functional entity);
- CCA Call Control (functional entity agent).

The following relationships shall exist between these FEs:

- ra between FE1 and FE2;
- rb between FE2 and FE3;
- rc between FE2 and FE4 in different TETRA systems;
- rd between FE4 and FE1;
- re between FE4 and FE3.

Figure 1 shows these FEs and their relationships.

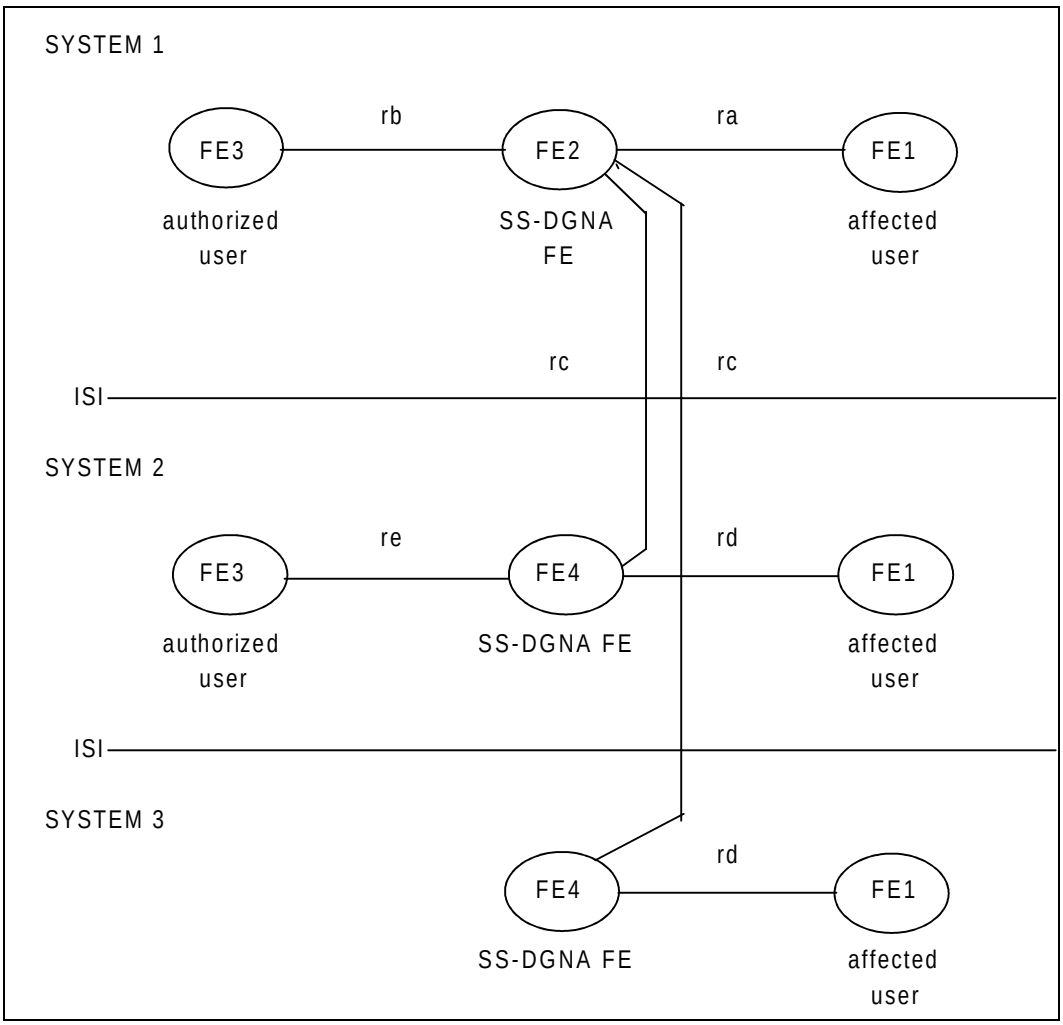


Figure 1: Functional model for SS-DGNA

4.1.2 Relationship with call related DGNA and basic service

Figure 2 shows the relationship that can occur between FEs and CCs/CCAs. In case of call unrelated DGNA there shall be no relationship between FEs and CC/CCAs.

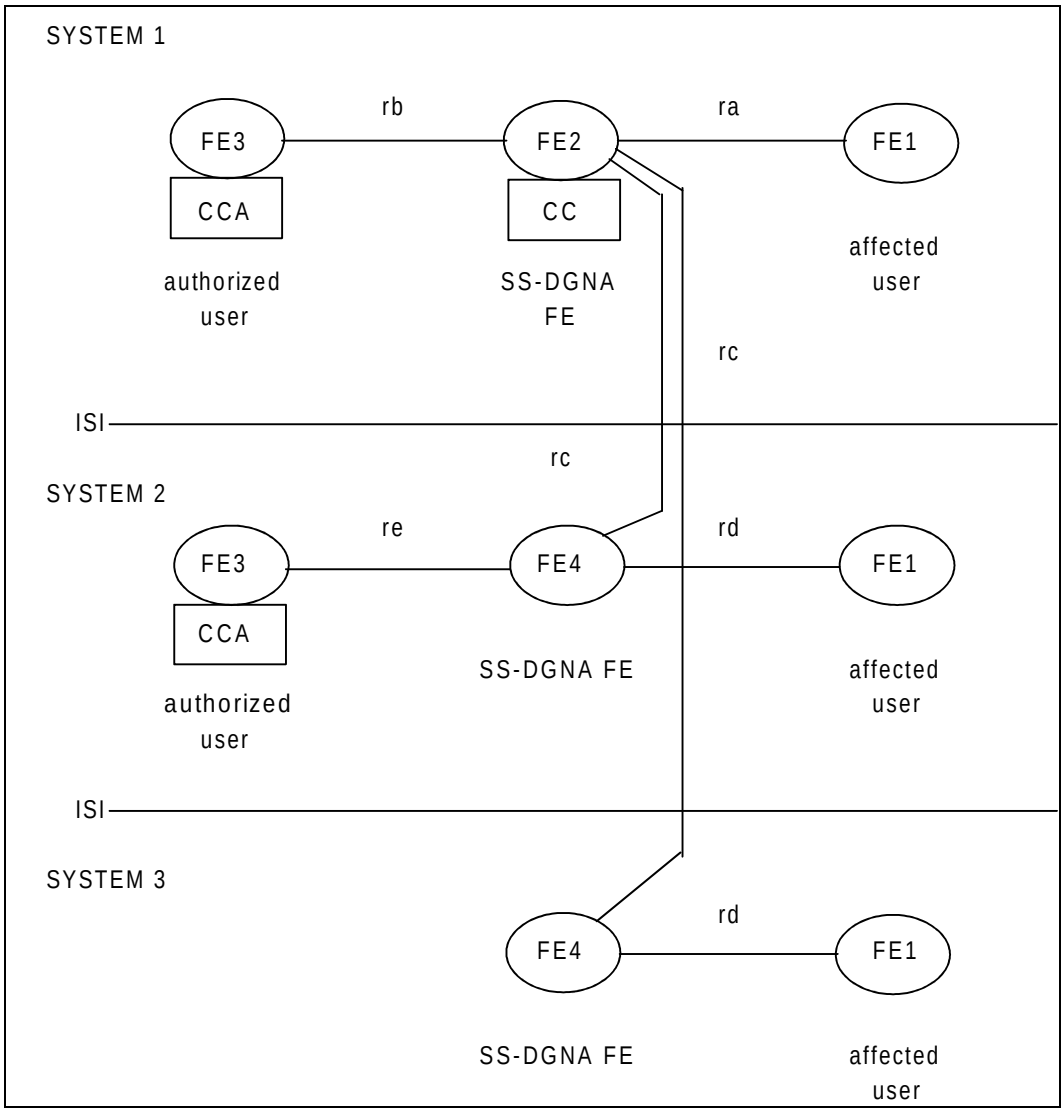


Figure 2: The relationships between the basic service and call related SS-DGNA functional entities

4.2 SS-DGNA service description

4.2.1 Functional entities and Circuit Mode Control Entity (CMCE) sub-entities

FEs, CCs and CCAs correspond to sub-entities in CMCE described in ETS 300 392-2 [4] according to the following rules:

- FE1: SS sub-entity in CMCE in User B's MS/LS;
- FE2: SS sub-entity in CMCE in SwMI in System 1;
- FE3: SS sub-entity in CMCE in authorized user's MS/LS;
- FE4: SS sub-entity in CMCE in SwMI in System 2;
- CC: CC sub-entity in CMCE in SwMI ;
- CCA: CC sub-entity in CMCE in MS/LS.

4.2.2 Protocol structure and protocol stack

Figure 3 shows the position of the layer 3 SS sub-entity within the CMCE and the TNSS-SAP in both the MS/LS and in the SwMI protocol stack. The SS-DGNA elements shall be conveyed in a SS FACILITY element within the SS sub-entity. The FACILITY element is then conveyed in any suitable CMCE PDU, see ETS 300 392-2 [4], subclause 14.7, between the MS/LS and the SwMI or over the ISI. This ETS is only normative for the protocol architecture and user application Service Access Points (SAPs) within the MS/LS but gives an informative description of the protocol and the SAPs within the SwMI.

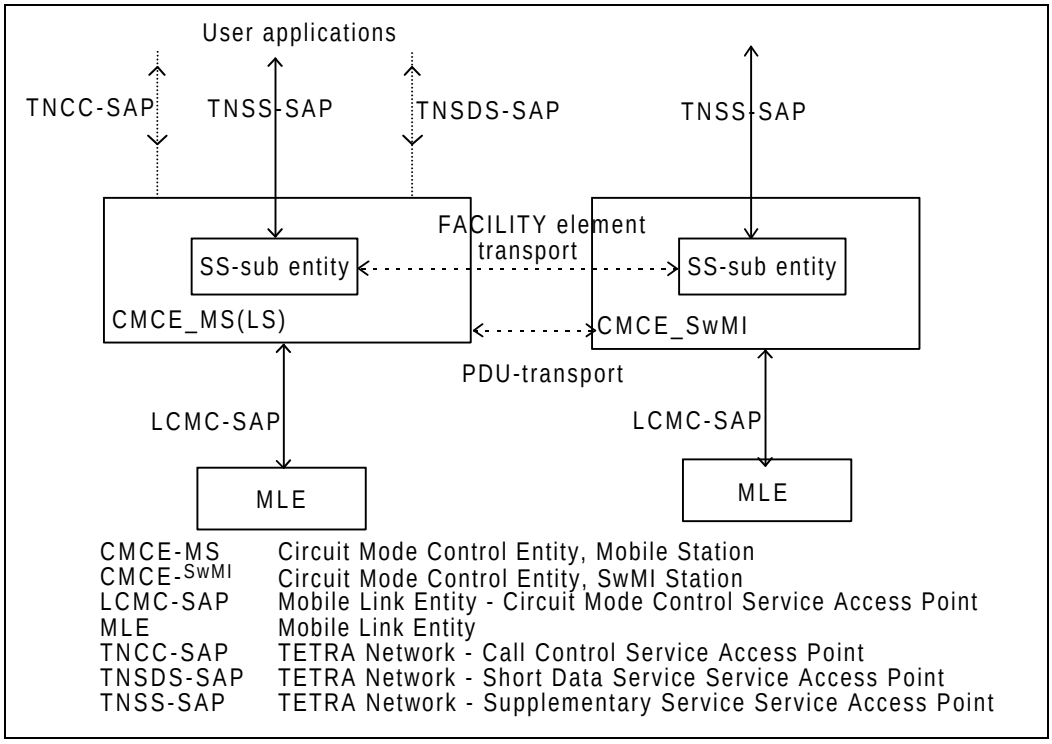


Figure 3: System view

5 SS-DGNA service description

5.1 General

This clause describes SS-DGNA specific services offered by the CMCE at the SS SAP (TNSS-SAP) to application, or vice versa, of the TETRA Voice plus Data (V+D) layer 3 service boundary. The specific SS-DGNA services shall be carried as arguments within the following 3 general generic supplementary service primitives:

a) TNSS-SERVICE;

b) TNSS-INFO;

c) TNSS-ERROR.

For a detailed description of the generic supplementary services primitives refer to ETS 300 392-2 [4], subclause 12.3. The flow of the generic SS primitives shall be as illustrated in figure 4.

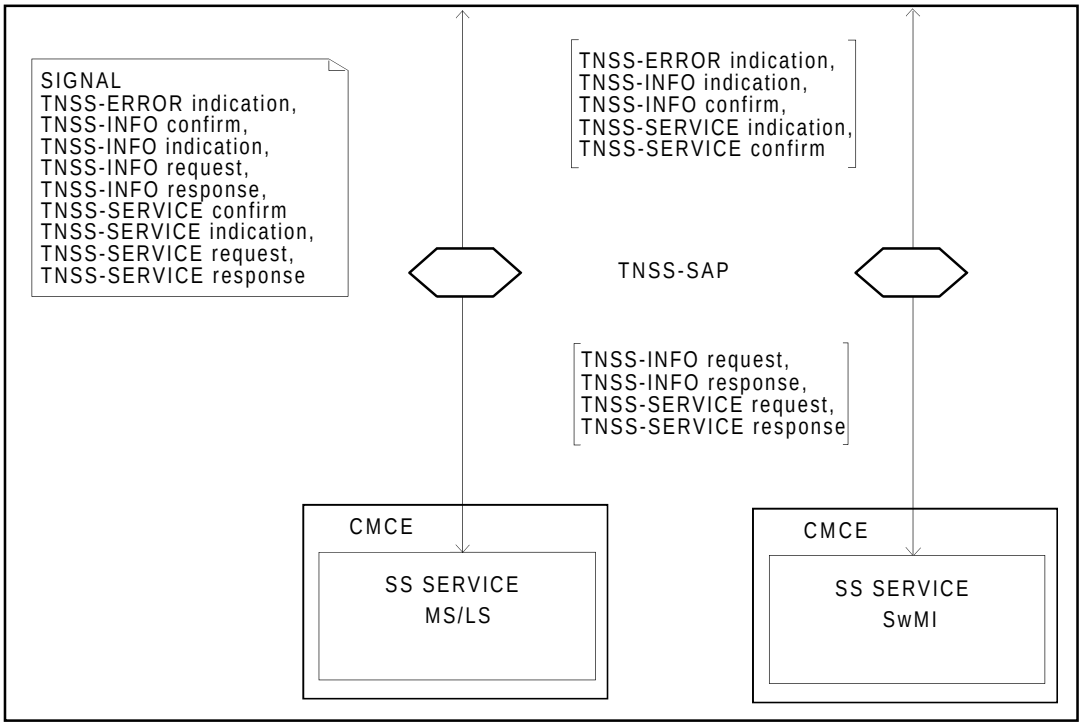


Figure 4: Supplementary services provided at the TNSS-SAP

The TNSS-SERVICE shall enable an invoking entity to request and to be informed about, an operation to be performed by the performing entity.

The TNSS-INFO shall enable an entity to be informed of ongoing transactions.

The TNSS-ERROR shall enable a performing entity to return the negative reply of a unsuccessfully performed operation to the invoking entity.

5.2 SS-DGNA services offered over the TNSS-SAP

5.2.1 SS-DGNA primitives

The primitives shall as operation argument contain the following SS-DGNA sub-arguments.

a) DEFINE request;
b) DEFINE-ACK confirm;
c) DELETE request;
d) DELETE-ACK confirm;
e) ASSIGN indication;
f) ASSING-ACK response;
g) DEASSIGN indication;
h) DEASSING-ACK response;
i) INTERROGATE request;
j) INTERROGATE-ACK: INTERROGATE1-ACK, INTERROGATE2-ACK, INTERROGATE3-ACK, INTERROGATE4-ACK confirm;
k) CANCEL request;
l) CANCEL-ACK confirm.

5.2.1.1 DEFINE request

DEFINE request primitive shall be offered from application to FE3 over TNSS-SAP. The primitive shall be used to request one or more groups to be defined to SwMI. The primitive can be used to define group related parameters and/or to assign groups to affected users. The primitive shall contain the SS-DGNA elements listed in table 1.

NOTE: If the acknowledgements are different for different "Defined group identities" FE2 shall send several DEFINE-ACKs to FE3.

Table 1: DEFINE request contents

Element	Request	Remark
SS-Type	M	DGNA
Action type	M	Definition
Argument type	M	Request
Call identifier	C	note 1
Defined group number type	C	note 2
Address type identifier	C	note 3
Short Number Address	C	note 4
Short Subscriber Identity	C	note 4
Address extension	C	note 4
Set reference	O	
Identity owner number type	O	
Address type identifier	C	note 3
Short Number Address	C	note 4
Short Subscriber Identity	C	note 4
Address extension	C	note 4
Acknowledged group call	O	Acknowledged
Broadcast	O	Broadcast
Mnemonic group name letter	O	Repeatable
Affected user number type	C	
Address type identifier	C	note 3
Short Number Address	C	note 4
Short Subscriber Identity	C	note 4
Address extension	C	note 4
Acknowledgement requested	O	
Class of usage	O	
Group Identity Attachment Lifetime	O	See ETS 300 392-2 [4], clause 16
Temporary assignment	O	

NOTE 1: Should be present in case of call related DGNA definition (addition).

NOTE 2: The defined group number can omitted in case of addition (creation) of a call related DGNA definition.

NOTE 3: Should be conditional on the value Affected user/Identity owner/Defined group number type. This element should be repeatable and should be present as many times as the value of Affected user/Identity owner/Defined group number type indicates.

NOTE 4: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.2 DEFINE-ACK confirm

DEFINE-ACK confirm primitive shall be offered from FE3 to application over TNSS-SAP. The primitive shall be used to acknowledge a previously requested group definition (definitions). The primitive shall contain the SS-DGNA elements listed in table 2.

NOTE: If FE3 requested the SS-DGNA definitions to be made to several identities in one definition request, FE2 may send several responses (DEFINE-ACKs).

Table 2: DEFINE-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Definition
Argument type	M	Acknowledgement
Call identifier	C	note 1
Defined group number type	M	
Address type identifier	M	note 2
Short Number Address	C	note 3
Short Subscriber Identity	C	note 3
Address extension	C	note 3
Result for definition request	M	

NOTE 1: Should be present in case of call related DGNA definition (addition).

NOTE 2: Should be conditional on the value Defined group number type. This element should be repeatable and should be present as many times as the value of Defined group number type indicates. At least one Address type identifier element should be present.

NOTE 3: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.3 DELETE request

DELETE request primitive shall be offered from application to FE3 over TNSS-SAP. The primitive shall be used to deleted defined groups from SwMI and/or to remove group assignments form affected users. If the groups are removed from affected users, the DEASSIGN information flows are sent to affected users.

The primitive shall contain the SS-DGNA elements listed in table 3.

When group is deleted, the assignment may not be removed from affected users. If the group shall be removed from affected users, if can be removed from all affected users, which is indicated by "Affected users removed" element without giving any affected users. If the group assignment shall be removed from selected affected users, these users shall be listed, in which case other affected users shall not be affected. Listing of Affected users shall imply that Deassignment shall have the value "Deassignment from affected users".

Table 3: DELETE request contents

Element	Request	Remark
SS-Type	M	DGNA
Action type	M	Deletion
Argument type	M	Request
Deleted group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Group deleted from SwMI	M	
Deassignment	M	
Affected user number type	O	
Address type identifier	C	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Acknowledgement request	O	

NOTE 1: Should be conditional on the value Deleted group/Affected user number type. This element should be repeatable and should be present as many times as the value of Deleted group/Affected user number type indicates. At least one Address type identifier element should be present to indicate a deleted group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.4 DELETE-ACK confirm

DELETE-ACK confirm primitive shall be offered from FE3 to application over TNSS-SAP. The primitive shall be used to acknowledge a previously sent deletion primitive. The primitive shall contain the SS-DGNA elements listed in table 4.

NOTE: If FE3 requested the SS-DGNA deletions to be made to several identities in one definition request, FE2 may send several responses (DELETE-ACKs).

The DELETE-ACK information flow elements are described in table 4.

Table 4: DELETE-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Deletion
Argument type	M	Acknowledgement
Deleted group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for deletion/removal	M	

NOTE 1: Should be conditional on the value Deleted group number type. This element should be repeatable and should be present as many times as the value of Deleted group number type indicates. At least one Address type identifier element should be present to indicate a deleted group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.5 ASSIGN indication

ASSIGN indication primitive shall be offered from FE1 to application over TNSS-SAP in order to assign group identities and/or parameters related to the group to the database in the affected user's MS/LS. The primitive shall contain the SS-DGNA elements listed in table 5.

Table 5: ASSIGN indication contents

Element	Indication	Remark
SS-Type	M	DGNA
Action type	M	Activation
Argument type	M	Request
Assigned group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Acknowledged group call	O	
Broadcast	O	
Mnemonic group name letter	O	Repeatable
Acknowledgement requested	O	
Class of usage	O	
Group Identity Attachment Lifetime	O	
Temporary assignment	O	

NOTE 1: Should be conditional on the value Assigned group number type. This element should be repeatable and should be present as many times as the value of Assigned group number type indicates. At least one Address type identifier element should be present to indicate an assigned group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.6 ASSIGN-ACK response

ASSIGN-ACK response primitive shall be offered from application to FE1 over TNSS-SAP. The primitive shall be used to acknowledge one or more group assignments made to affected user. The primitive shall contain the SS-DGNA elements listed in table 6. The primitive is sent only, if the acknowledgement was requested in the received ASSIGN request.

The Acknowledgement shall be valid for all given group identities in ASSIGN-ACK.

Table 6: ASSIGN-ACK response contents

Element	Response	Remark
SS-Type	M	DGNA
Action type	M	Activation
Argument type	M	Acknowledgement
Assigned group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for assignment	M	
NOTE 1: Should be conditional on the value Assigned group number type. This element should be repeatable and should be present as many times as the value of Assigned group number type indicates. At least one Address type identifier element should be present to indicate an assigned group identity.		
NOTE 2: Should be conditional on the value of Address type identifier: 0: Short Number Address; 1: Short Subscriber Identity: 2: Short Subscriber Identity and Address extension The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.		

5.2.1.7 DEASSIGN indication

DEASSIGN indication primitive shall be offered from FE1 to application over TNSS-SAP. The primitive shall be used to remove group assignments from affected users. The primitive contains the SS-DGNA elements listed in table 7.

Application shall update the database in MS/LS. The definition shall be valid from the moment it is made and all applicable entities in layer 2 and in layer 3 shall have the knowledge of the definition.

Application can initiate the network authentication procedure, and it can select to accept the assignment based on the authentication. The network authentication procedure is described in ETS 300 392-7 [7].

Table 7: DEASSIGN indication contents

Element	Indication	Remark
SS-Type	M	DGNA
Action type	M	Deactivation
Argument type	M	Request
Deassigned group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Acknowledgement requested	O	

NOTE 1: Should be conditional on the value Deassigned group number type. This element should be repeatable and should be present as many times as the value of Deassigned group number type indicates. At least one Address type identifier element should be present to indicate a deassigned group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.8 DEASSIGN-ACK response

DEASSIGN-ACK response primitive shall be offered from FE1 to application over TNSS-SAP. The primitive shall contain the SS-DGNA elements listed in table 8. The primitive shall be sent to acknowledge requested group deassignments and it is sent only, if the acknowledgement was requested in the received DEASSIGN-ACK request.

The Acknowledgement element shall be valid for all deassigned group identities given in DEASSIGN-ACK.

Table 8: DEASSIGN-ACK response contents

Element	Response	Remark
SS-Type	M	DGNA
Action type	M	Deactivation
Argument type	M	Request
Deassigned group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for deassignment	M	

NOTE 1: Should be conditional on the value Deassigned group number type. This element should be repeatable and should be present as many times as the value of Deassigned group number type indicates. At least one Address type identifier element should be present to indicate a deassigned group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

5.2.1.9 INTERROGATE request

INTERROGATE request primitive shall be offered from application to FE1 and FE3 over TNSS-SAP when authorized or affected user interrogates group definitions. INTERROGATE primitive shall contain the SS-DGNA elements listed in table 9.

Table 9: INTERROGATE request contents

Element	Request	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Request
Interrogation type	M	
Interrogated group/user number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
NOTE 1: Should be conditional on the value Interrogated group/user number type. This element should be repeatable and should be present as many times as the value of Interrogated group/user number type indicates. At least one Address type identifier element should be present to indicate an interrogated group/user identity.		
NOTE 2: Should be conditional on the value of Address type identifier: 0: Short Number Address; 1: Short Subscriber Identity; 2: Short Subscriber Identity and Address extension. The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.		

5.2.1.10 INTERROGATE1-ACK confirm

INTERROGATE1-ACK confirm primitive is offered from FE3 to application over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE1-ACK primitive shall contain the SS-DGNA elements listed in table 10.

The interrogation response shall contain the (completion) status of the SS-DGNA definition: the DGNA number definition status (defined/not defined/partially defined (the specific reason shall be returned))

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one definition request, FE2 may send several responses (INTERROGATE1-ACKs).

Table 10: INTERROGATE1-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Acknowledgement
Interrogation type	M	
Interrogated group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for interrogation	M	
Result for definition	C	note 3
NOTE 1: Should be conditional on the value Interrogated group number type. This element should be repeatable and should be present as many times as the value of Interrogated group number type indicates. At least one Address type identifier element should be present to indicate an interrogated group identity.		
NOTE 2: Should be conditional on the value of Address type identifier: 0: Short Number Address; 1: Short Subscriber Identity; 2: Short Subscriber Identity and Address extension. The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.		
NOTE 3: Should be present if Result for interrogation has the value Accepted.		

5.2.1.11 INTERROGATE2-ACK confirm

INTERROGATE2-ACK confirm primitive is offered from FE3 to application over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE2-ACK primitive shall contain the SS-DGNA elements listed in table 11.

The interrogation response shall contain a list of DGNA numbers added/modified by the given user identity (authorized user). At the maximum, the ten previously defined/modified groups can be given.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one definition request, FE2 may send several responses (INTERROGATE2-ACKs).

Table 11: INTERROGATE2-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Acknowledgement
Interrogation type	M	
Interrogated user number type	M	
Address type identifier	M	
Short Number Address	C	note 1
Short Subscriber Identity	C	note 1
Address extension	C	note 1
Result for interrogation	M	
Defined group number type	O	note 2
Address type identifier	C	note 3
Short Number Address	C	note 1
Short Subscriber Identity	C	note 1
Address extension	C	note 1

NOTE 1: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

NOTE 2: Element should be present, if interrogation was accepted and if authorized user has added/modified any groups.

NOTE 3: The element should be repeated as many times as indicated by Defined group number type. One address type should be followed by SNA, SSI or SSI and Address extension.

5.2.1.12 INTERROGATE3-ACK confirm

INTERROGATE3-ACK confirm primitive is offered from FE3 to application over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE3-ACK primitive shall contain the SS-DGNA elements listed in table 12.

The interrogation response shall contain a list of the defined parameters for the given SS-DGNA number for authorized user.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one definition request, FE2 may send several responses (INTERROGATE3-ACKs).

Table 12: INTERROGATE3-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Acknowledgement
Interrogation type	M	
Interrogated group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for interrogation	M	
Set reference	O	note 3
Identity owner number type	O	note 3
Address type identifier	C	note 1, note 3
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Acknowledged group call	O	note 3
Broadcast	O	note 3
Mnemonic group name letter	O	Repeatable, note 3
Assignment indication	O	note 3
Acknowledgement requested	O	note 3
Class of usage	O	note 3
Group Identity Attachment Lifetime	O	note 3
Temporary assignment	O	note 3

NOTE 1: Should be conditional on the value Interrogated group/ Identity owner number type. This element should be repeatable and should be present as many times as the value of Interrogated group/ Identity owner number type indicates. At least one Address type identifier element should be present to indicate an interrogated group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

NOTE 3: Should be present only if the Result for interrogation has the value Accepted. However, an optional element is omitted if it has not been defined.

5.2.1.13 INTERROGATE4-ACK confirm

INTERROGATE4-ACK confirm primitive is offered from FE1 to application over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE4-ACK primitive shall contain the SS-DGNA elements listed in table 13.

The interrogation response shall contain the list of the defined parameters for the given SS-DGNA number for Affected user. FE1 should update the parameters in the database in MS/LS according to the received parameters, if different from the received ones.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one definition request, FE2 may send several responses (INTERROGATE4-ACKs).

Table 13: INTERROGATE4-ACK confirm contents

Element	Confirm/ Indication	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Acknowledgement
Interrogation type	M	
Interrogated group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for interrogation	M	
Acknowledged group call	O	note 3
Broadcast	O	note 3
Mnemonic group name letter	O	Repeatable, note 3
Class of usage	O	note 3
Group Identity Attachment Lifetime	O	note 3
Temporary assignment	O	note 3

NOTE 1: Should be conditional on the value Interrogated group number type. This element should be repeatable and should be present as many times as the value of Interrogated group number type indicates. At least one Address type identifier element should be present to indicate an interrogated group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

NOTE 3: Should be present only if the Result for interrogation has the value Accepted. However, an optional element is omitted if it has not been defined.

5.2.1.14 INTERROGATE5-ACK confirm

INTERROGATE5-ACK confirm primitive is offered from FE3 to application over TNSS-SAP as a response to a previously sent interrogation request. INTERROGATE5-ACK primitive shall contain the SS-DGNA elements listed in table 14.

The interrogation response shall contain a list of Affected users that are assigned the given SS-DGNA and whether the user has acknowledged the assignment

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one definition request, FE2 may send several responses (INTERROGATE5-ACKs).

Table 14: INTERROGATE5-ACK confirm contents

Element	Confirm/ Indication	Remark
SS-Type	M	DGNA
Action type	M	Interrogation
Argument type	M	Acknowledgement
Interrogation type	M	
Interrogated group number type	M	
Address type identifier	M	note 1
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Result for interrogation	M	
Affected user number type	C	note 3
Address type identifier	C	note 1, note 3
Short Number Address	C	note 2
Short Subscriber Identity	C	note 2
Address extension	C	note 2
Acknowledgement reception	O	note 3

NOTE 1: Should be conditional on the value Interrogated group/ Affected user number type. This element should be repeatable and should be present as many times as the value of Interrogated group/Affected user number type indicates. At least one Address type identifier element should be present to indicate an interrogated group identity.

NOTE 2: Should be conditional on the value of Address type identifier:
0: Short Number Address;
1: Short Subscriber Identity;
2: Short Subscriber Identity and Address extension.
The element is repeated in conjunction with Address type identifier. The element(s) should be placed after the Address type identifier that indicated the presence of the element. Address extension, if used, should be placed after Short Subscriber Identity.

NOTE 3: Should be present only if the Result for interrogation has the value Accepted. However, an optional element is omitted if it has not been defined.

5.2.1.15 CANCEL request

CANCEL request primitive shall be offered from FE3 to application over TNSS-SAP. The primitive shall contain the SS-DGNA elements listed in table 15.

Table 15: CANCEL request contents

Element	Request	Remark
SS-Type	M	DGNA
Action type	M	Cancellation
Argument type	M	Request
Call identifier	C	note 1
Address type identifier	C	Defined group
Short Number Address	C	Defined group, note 2
Short Subscriber Identity	C	Defined group, note 2
Address extension	C	Defined group, note 2
Address type identifier	M	Existing group
Short Number Address	C	Existing group, note 2
Short Subscriber Identity	C	Existing group, note 2
Address extension	C	Existing group, note 2
NOTE 1 The call identifier should be included in case of cancellation of a call related DGNA definition. Otherwise, it should be omitted. NOTE 2: Should be conditional on the value of Address Type Identifier (ATI): ATI = 0; Short Number Address (SNA). ATI = 1; Short Subscriber Identity (SSI). ATI = 2; Short Subscriber Identity (SSI) + Address Extension. Elements related to defined group should be given only in case of cancellation of a call unrelated DGNA definition. Elements related to defined group may be given in case of call related DGNA.		

5.2.1.16 CANCEL-ACK confirm

CANCEL-ACK primitive shall be offered from application to FE3 over TNSS-SAP. The primitive shall contain the SS-DGNA elements listed in table 16.

Table 16: CANCEL-ACK confirm contents

Element	Confirm	Remark
SS-Type	M	DGNA
Action type	M	Cancellation
Argument type	M	Acknowledgement
Call identifier	C	note 1
Address type identifier	C	Defined group
Short Number Address	C	Defined group, note 2
Short Subscriber Identity	C	Defined group, note 2
Address extension	C	Defined group, note 2
Response for cancellation	M	
NOTE 1 The call identifier should be included in case of cancellation of a call related DGNA definition. Otherwise, it should be omitted. NOTE 2: Should be conditional on the value of Address type identifier (ATI): ATI = 0; Short Number Address (SNA). ATI = 1; Short Subscriber Identity (SSI). ATI = 2; Short Subscriber Identity (SSI) + Address Extension. Elements related to defined group should be given only in case of cancellation of a call unrelated DGNA definition. Elements related to defined group may be given in case of call related DGNA.		

5.2.2 Primitive descriptions

Acknowledged group call =

1 Acknowledged group call;
2 Non-acknowledged group call.

Acknowledgement requested =

1 Acknowledgement requested from affected users;
2 No acknowledgement requested from affected users.

Acknowledgement reception =

1 acknowledgement received;
2 acknowledgement not received.

Action type =

1 Definition;
2 Deletion;
3 Activation;
4 Deactivation;
5 Interrogation;
6 Cancellation.

Address extension =

Mobile Country Code (MCC) + Mobile Network Code (MNC).
See ETS 300 392-1 [5] clause 7.

Address type identifier =

0 Short Number address (SNA);
1 Short Subscriber Identity;
2 TETRA Subscriber Identity (TSI = SSI + Address Extension).
See ETS 300 392-1 [5] clause 7.

Affected user number type =

0 Group number, 1 group number following;
1 Range of numbers, 2 group numbers following;
2 List of group numbers, 2 group numbers following;
3 List of group numbers, 3 group numbers following;
4 List of group numbers, 4 group numbers following;
5 List of group numbers, 5 group numbers following;
6 List of group numbers, 6 group numbers following;
7 List of group numbers, 7 group numbers following;
8 List of group numbers, 8 group numbers following;
9 List of group numbers, 9 group numbers following;
10 List of group numbers, 10 group numbers following.

Assigned group number type, see Affected user number type.

Argument type =

1 Request;
2 Acknowledgement/Response.

Assignment =

0 Assignment;
1 No assignment.

Authorized user number type, see Affected user number type.

Broadcast =

0 Broadcast group call;
1 Non-broadcast group call.

Call identifier, see ETS 300 392-2 [4], clause 14.

Cancellation request response =

0 Cancelled;
1 Not cancelled.

Class of usage =

1 1;
2 2;
3 3;
4 4;
5 5;
6 6;
7 7;
8 8.

Deassigned group number type, see Affected user number type.

Deassigned user number type, see Affected user number type.

Deassignment =

0	Deassignment;
1	No deassignment.

Defined group number type, as Affected user number type.

Deleted group number type, as Affected user number type.

Existing group number type, as Affected user number type.

Group Identity Attachment Lifetime, see ETS 300 392-2 [4], clause 16.

Group deleted from SwMI =

0	Deleted;
1	Not deleted.

Identity owner number type, see Affected user number type.

Interrogated group number type, see Affected user number type.

Interrogated user number type, see Affected user number type.

Interrogation type

1	Completion status of definition/deletion;
2	List of groups added/modified by the requesting user;
3	Group parameters for authorized user;
4	Received acknowledgement from affected users;
5	Group parameters for affected user.

Mnemonic group name letter =

Repeatable element, format defined in ISO 8859-1 [2].

Number of letters in mnemonic group name =

1	1 letter;
2	2 letters;
3	3 letters;
...	
16	16 letters.

Result for assignment =

1	Accepted;
2	Rejected for any reason;
3	Network authentication failed;
4	Database overflow (applicable only for assignment).

Result for deassignment, see Result for assignment.

Result for definition =

1 Accepted by SwMI;
2 Accepted but parameter(s) changed by SwMI;
3 Request failed for any reason;
4 User not authorized;
5 Unknown TETRA identity;
6 Not valid DGNA identity;
7 Parameters not valid;
8 Insufficient information;
9 Group definition accepted, but one or more affected users could not accept the request/one or more affected users where not reached;
10 Group deletion accepted, but one or more affected users where not reached.

NOTE: Values 9 and 10 are applicable only for interrogation of Completion status of definition/deletion.

Result for deletion =

See Result for definition.

Result for interrogation =

1 Accepted;
2 User not authorized;
3 Parameters not valid;
4 Request failed for any reason.

Set reference =

1 Set 1;
2 Set 2;
3 Set 3;
4 Set 4;
5 Set 5;
6 Set 6;
7 Set 7;
8 Set 8.

Short Number Address =

Short Number address (SNA), see ETS 300 392-1 [5], clause 7.

Short Subscriber Identity =

Short Subscriber Identity (SSI), see ETS 300 392-1 [5], clause 7.

Temporary definition =

1 Pre-defined value;
2 1 minute;
3 2 minutes;
4 5 minutes;
5 10 minutes;
6 20 minutes;
7 30 minutes;
8 60 minutes.

5.2.3 Mapping of SS-DGNA primitives to TNSS primitives

SS-DGNA primitives shall be mapped by FEs to TNSS-SERVICE, TNSS-INFO and TNSS-ERROR primitives according to table 17 and 18. The table 17 describes the behaviour for FE1 and table 18 for FE3.

Table 17: Mapping of the SS-DGNA primitives to TNSS primitives in FE1

SS-DGNA Primitive	TNSS-SERVICE indication	TNSS-SERVICE response	TNSS-SERVICE request	TNSS-SERVICE confirm	TNSS-ERROR indication	Remark
ASSIGN	applied	-	-	-	-	
ASSING-ACK	-	applied	-	-	-	
DEASSIGN	applied	-	-	-	-	
DEASSIGN-ACK	-	applied	-	-	-	
INTERROGATE	-	-	applied		-	note 1, note 2
INTERROGATE-ACK				for successful interrogation	for unsuccessful interrogation	note 1, note 2
NOTE 1: For this purpose, the definition shall be considered as successful if it is not barred by FE1; the definition shall be considered by unsuccessful, if the definition is barred by FE1.						
NOTE 2: This applies to all INTERROGATE requests and responses (-ACKs).						

Table 18: Mapping of the SS-DGNA primitives to TNSS primitives in FE3

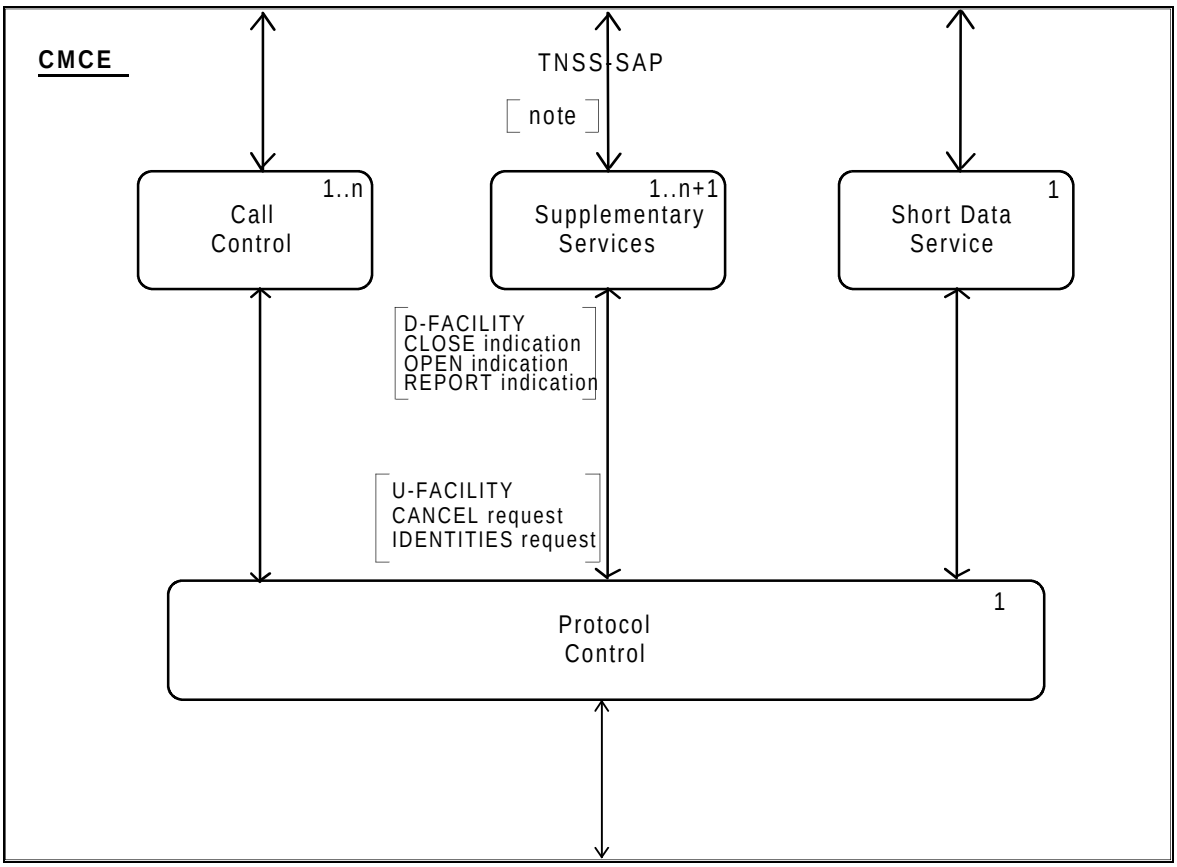
SS-DGNA Primitive	TNSS-SERVICE request	TNSS-SERVICE confirmation	TNSS-ERROR indication	Remark
DEFINE	applied	-	-	
DEFINE-ACK	-	for successful definition	for unsuccessful definition	note 1
DELETE	applied	-	-	
DELETE-ACK	-	for successful definition	for unsuccessful definition	note 1
INTERROGATE	applied	-	-	note 2
INTERROGATE-ACK	-	for successful interrogation	for unsuccessful interrogation	note 1, note 2
CANCEL	applied	-	-	
CANCEL-ACK	-	for successful interrogation	for unsuccessful interrogation	note 1
NOTE 1: For this purpose, the definition shall be considered as successful if it is not barred by FE3; the definition shall be considered by unsuccessful, if the definition is barred by FE3.				
NOTE 2: This applies to all INTERROGATE requests and responses (-ACKs).				

6 SS-DGNA protocol description

6.1 Overview

Figure 5 shows the position of the SS sub-entity within the layer 3 of the MS/LS protocol stack.

NOTE: Internal communication between the CC process and the SS process is outside the scope of this ETS



NOTE: SS-DGNA protocol states are described below.

Figure 5: Block view of CMCE for MS/LS

6.2 SS-DGNA protocol states

The normal SS-DGNA protocol states are described below.

6.2.1 Protocol states of FE1

6.2.1.1 State IDLE

IDLE shall be the normal state of FE1. In this state FE1 shall receive the SS-DGNA group assignment and deassignment requests and responses. FE1 shall also receive the interrogation requests and responses in state IDLE. If the information is received from application it shall be sent to PC to be sent to SwMI. If the information is received from SwMI is shall be sent to application.

FE1 shall convert the information received in PDUs to primitives and information received in primitives to PDUs.

After delivering the information, FE1 shall return to state IDLE.

If the assignment, deassignment or interrogation is requested for a subscriber number range or a list of subscriber numbers, the "Result for assignment/deassignment/interrogation" can be different for different subscriber numbers. In that case, FE1 shall send separate acknowledgements (PDUs or FACILITY elements) to FE2.

6.2.2 Protocol states of FE2

6.2.2.1 State IDLE

IDLE should be the normal state of FE2. In this state FE2 receives the definition, deletion and interrogation requests from FE3. At the reception of SS-DGNA definition, deletion or interrogation request, FE2 should verify that the request is authorized and that the parameters are in the correct range. After making the checks, FE2 either continues to carry out the request, or rejects it.

In case of definition, deletion or interrogation request, FE2 should send the definition, deletion and interrogation response (acknowledgement) to FE3.

If FE2 accepted the definition/deletion request and if assignment/deassignment to FE1s was requested, FE2 should start timer T1 to supervise the sending of assignment/deassignment requests to FE1(s), send the request(s) to FE1(s) and should move to WAIT-FOR-ACK state.

6.2.2.2 State WAIT-FOR-ACK

In WAIT-FOR-ACK state FE2 should wait for the response(s) from FE1(s). When FE1(s) has (have) acknowledged the request or if the timer T1 expires, FE2 should return to state IDLE.

NOTE: As an operator option, FE2 may keep the definition requests for FE1(s) and send them later, if one or more FE1s cannot be reached or has (have) not acknowledged the request, even if the request was requested.

6.2.3 Protocol states of FE3

6.2.3.1 State IDLE

IDLE shall be the normal state of FE3. In this state FE3 shall receive the definition or interrogation requests from the user. FE3 shall verify the requests and if it founds no reason to bar them, FE3 shall send them to FE2. If FE3 bars the request, it shall send an acknowledgement to the application.

At the reception of SS-DGNA definition or interrogation request from user application, FE3 can verify that the parameters are in allowed range and if it founds them suitable, it shall produce the definition/interrogation request according to the request from application. FE3 shall make the PDUs according to the descriptions in subclause 6.5. FE3 shall send the definition/interrogation request to FE2. If FE3 barred the definition locally, FE3 shall send an indication to the user application.

In IDLE state FE3 shall also receive the acknowledgements and responses for the definition or interrogation requests. At the reception of these information flows, FE3 shall send them to the application.

6.2.4 Protocol states of FE4

6.2.4.1 State IDLE

IDLE should be the normal and only state of FE4. In this state FE4 should receive the definition and interrogation information flows from FE3 (FE1) to be delivered to FE2 in another system. FE4 should also receive the information flows from FE2 to be delivered to FE1 or FE3 located in this system.

6.3 Procedures

6.3.1 Procedures for FE1

6.3.1.1 Verification for interrogation

FE1 shall construct the SS-DGNA interrogation (INTERROGATE) PDU for affected user according to the user's request. The affected user can interrogate the DGNA group parameters for the groups he is member of. However, FE1 should not bar any interrogation requests, if it does not have any knowledge of the user's membership to a group.

The affected user can interrogate the defined DGNA for:

- one subscriber or group number;
- a list of subscriber or group numbers;
- a range of subscriber or group numbers.

At the reception of SS-DGNA interrogation request from application, FE1 can verify that the parameters are in the correct range. After making the checks, FE1 either continues to carry out the request, or rejects it.

At the reception of the interrogation response from SwMI, the affected user should update the parameters in the database of his MS/LS unit according to the received response. Thus, the interrogation response can be interpreted as a modification definition.

There can be group parameters that are defined for the group and for the subscriber independently, in this case the subscriber specific parameters shall override the parameters defined for the group, e.g. the members of the group can have different values for the class of usage of one group. If this is the case, FE2 (FE4) should provide the affected user the parameters that are defined for him, and not the values defined for the group.

Annex A gives examples of INTERROGATE facility element contents sent by FE1.

6.3.1.2 Verification for assignment

FE1 shall send the assignment request to the application.

Application should accept the assignment and update the database in MS/LS. Application can initiate the network authentication procedure before accepting the assignment, especially if a group with class of usage having value 6 or 7 is assigned. FE1 should reject the assignment, if the authentication fails. The network authentication procedure is described in ETS 300 392-7 [7].

The DGNA numbers given in the ASSIGN information flow should be used as valid layer 2 addresses, if the information flow includes the Group Identity Attachment Lifetime element. If the assigned DGNA numbers are defined as valid layer 2 addresses they shall be known to Mobility Management (MM), Mobile Link Entity (MLE), CMCE, Short Data Service (SDS), Specific Connectionless Network Layer Protocol (SCNLP) and Connection Oriented Network Protocol (CONP) services from the moment the definition is made and the MS shall be able to recognize any basic services addressed with the group identity.

After a group has been assigned with DGNA, it can be attached or detached from being a valid layer 2 address as described in ETS 300 392-2 [4], clause 16.

The application shall send an acknowledgement back to FE1, which shall send it to FE2 (FE4) if the acknowledgement was requested in the ASSIGN request. The attachment in ASSIGN-ACK shall indicate if the group is used as valid layer 2 address by the MS (LS), if group identity attachment lifetime element was included in the assignment request.

6.3.1.3 Verification for deassignment

FE1 shall send the deassignment request to the application.

Application should accept the deassignment and update the database in MS/LS. Application can initiate the network authentication procedure before accepting the deassignment, especially if a group with class of usage having value 6 or 7 is removed. FE1 should reject the deassignment, if the authentication fails. The network authentication procedure is described in ETS 300 392-7 [7].

The DGNA numbers given in the DEASSIGN information flow should be removed from the database in MS/LS and they should not be used as valid layer 2 addresses and the removal should be known to all applicable layer 3 sub-entities, from the moment the deassignment is made in MS/LS.

The application shall send an acknowledgement back to FE1, which shall send it to FE2 (FE4) if the acknowledgement was requested in the DEASSIGN request.

6.3.2 Procedures for FE2

6.3.2.1 Definition in FE2

After verifying the definition request, FE2 should save the definition to the database in SwMI and acknowledge the definition request.

In case of call related DGNA definition, FE2 should retrieve the call data with the call identifier and use the call data to make the definition. If the defined group identifier was omitted in a call related DGNA definition, FE2 should assign the defined group identifier and return it to the FE3 with DEFINE-ACK.

If FE2 accepts the definition request, it should save the defined group(a) and related parameters in the database of the SwMI. FE2 can authenticate the authorized user that has sent a DGNA definition request. The authentication procedure is described in ETS 300 392-7 [7].

If the authorized user requested several DGNA definitions in one request, one response may be sent to FE3. However, if the responses to these requests are different, several separate responses should be sent to FE3.

6.3.2.2 Deletion in FE2

After verifying the deletion request, FE2 should remove the definition from the database in SwMI and acknowledge the deletion request. If the authorized user requested several DGNA deletions in one request, one response may be sent to FE3. However, if the responses to these requests are different, several separate responses should be sent to FE3.

FE2 can authenticate the authorized user that has sent a DGNA deletion request. The authentication procedure is described in ETS 300 392-7 [7].

If the authorized user requested the groups to be removed from affected users, FE2 should produce the deassignment requests as defined in subclause 5.4 and send the requests to FE1s. If the authorized users are requested to acknowledge these requests, FE2 should receive the acknowledgements.

NOTE: FE2 can send the deassignment requests to affected users, if it can not reach them, when the authorized user requests for the removal of group members.

6.3.2.3 Interrogation in FE2 for affected user

At the reception of an interrogation request to affected user, FE2 should verify the request, and if the request is accepted, send the response to FE1.

FE2 can authenticate the affected user that has sent a DGNA interrogation request. The authentication procedure is described in ETS 300 392-7 [7].

An affected user can have subscriber specific values for group parameters. These subscriber specific values override the group specific values if accepted by SwMI and defined after the group specific values. However, when any of these values is changed the information should be sent to both parties to ensure the integrity in the system.

If an interrogation is requested for a subscriber number range or a list of subscriber numbers, the "Result for interrogation" can be different for different subscriber numbers. In that case, FE2 should send separate acknowledgements (using FACILITY elements) to FE3.

Annex A gives an example of INTERROGATE-ACKs sent by FE2 to FE1.

6.3.2.4 Interrogation in FE2 for authorized user

After verifying the interrogation request from authorized user, FE2 should send the interrogation response to FE3. The interrogation response can be any of the types described for authorized user in subclause 5.5.

FE2 can authenticate the authorized user that has sent a DGNA interrogation request. The authentication procedure is described in ETS 300 392-7 [7].

6.3.2.5 Assignment/Dessignment in FE2

If the DEFINE/DELETE request received from FE3 included the sending of assignment/deassignment requests to affected users, FE2 should produce the assignments/deassignments and send them to FE1s. At the reception of the acknowledgement, if requested, FE2 should save information about the FE1's acknowledgement.

NOTE: If one or more affected users is not reached when the definition is made, FE2 can send the ASSIGN/DEASSIGN request to FE1s later, in order to complete the definition process.

6.3.3 Procedures for FE3

6.3.3.1 Verification for Definition in FE3

FE3 shall construct the SS-DGNA definition (i.e. DEFINE) FACILITY element according to the user's request. The definition can be made to:

- one group number;
- a list of group numbers;
- a range of group numbers.

Different parameters can be used to define the group(s):

- call identifier: indicates the group call that should be used for the call related DGNA definition;
- set reference: in order to avoid sending the group parameter in the group definition parameter sets can be pre-defined and referenced in a definition request;
- mnemonic name: gives more information to the affected user about the defined group;
- if definition should be used for acknowledged group calls;

  NOTE: The element should not cause any restrictions in the MS/LS, if the SwMI invokes the call in a different way than what the parameter indicates, e.g. an acknowledged group is made in unacknowledged mode.

- if definition should be used for broadcast group calls;

  NOTE: The element should not cause any restrictions in the MS/LS, if the SwMI invokes the call in a different way than what the parameter indicates, e.g. an acknowledged group is made in unacknowledged mode.

- assignment indication: indicates if the group is downloaded to any affected users;
- affected user(s): to whom the definition is downloaded;
- acknowledgement requested: indicates whether the affected user(s) should acknowledge the group assignment;
- class of usage: indicates how the affected user's MS/LS should behave and handle group calls;
- group identity attachment lifetime: indicates the validity of the group id. as layer 2 address in MS;
- temporary assignment: indicates the lifetime of the group assignment;

- identity owner: authorized users which are allowed to define, delete and interrogate the group;

- manufacturer specific information.

If the authorized user uses SNA numbers in the definition request, the SNA shall be defined for the authorized user and these definitions shall be used to determine the TSI number. SNA can not be used for creation of SS-DGNA number, but it can be used to change (define) group parameters of an existing group. If the authorized user uses SSI form numbers, the Address extension (Country Code and Network Code) are interpreted as equal to the Address extension of the authorized user.

Annex A gives an example of contents in a DEFINE Facility element.

6.3.3.2 Verification for Interrogation in FE3

FE3 shall construct the SS-DGNA interrogation (i.e. INTERROGATE) PDU for authorized user according to the user's request. The user can interrogate the defined DGNA for:

- one subscriber or group number;

- a list of subscriber or group numbers;

- a range of subscriber or group numbers.

The authorized user can interrogate:

- completion status of the group;

- list of groups added/modified by the requesting authorized user;

- group parameters;

- group parameters for an affected user;

- received acknowledgement from affected users.

Annex A gives examples of INTERROGATE facility element contents sent by authorized user.

6.3.4 Procedures for FE4

6.3.4.1 Routing address in FE4

If FE4 receives any information flow, that should be routed over ISI to another TETRA system, FE4 adds the routing address to the request. If FE4 receives any information flow from another TETRA system over ISI, FE4 should deliver the request to FE1/FE3 located in the same system (as FE4).

FE4 should also add the Visited system group number, (V)GTSI, to the assignment messages delivered to FE1s when the assignment is received over ISI from another TETRA system.

6.4 Protocol timers

FE2 should use a timer T1 to supervise the acknowledgements for DGNA assignments and deassingments from affected users.

6.5 PDU descriptions

The SS-FACILITY element, which shall be used to convey the supplementary service information to and from MS/LS and over the ISI, can be transported in any CC PDU if inside a call or in a D/U-FACILITY or D/U-FACILITY PDU if the information is call-unrelated. The element coding used is in accordance with the general rules specified in ETS 300 392-2 [4], clause 14.

The specific SS-FACILITY element coding (independently of bearer PDU) for SS-DGNA is detailed in the following subclauses.

The information contained in the following SS-FACILITY description tables correspond to the following key:

- Length: length of the sub-argument in bits;
- Type: element type (1, 2 or 3) described in ETS 300 392-2 [4], clause 14;
- C/O/M: conditional/optional/mandatory;
- Remark: comment.

However, the element type 2 can be conditional to a conditional element.

6.5.1 DEFINE

DEFINE information flow, table 19, shall be offered from FE3 to FE2, and possibly to FE4. The information flow shall be used to define one or more groups and group parameters to SwMI and/or assign groups and group parameters to affected users. The flow is offered to FE4 only if FE3 is in TETRA system 2.

Several groups can be defined with the same DEFINE request, if all the elements and their values shall be common to all these groups, e.g. if two different group identities are given as defined groups in one DEFINE PDU that implies that all following elements and their values in the DEFINE PDU shall be defined for both groups. If different elements or element values should be defined, the groups shall be defined with different DEFINE PDUs.

NOTE: If the acknowledgements are different for different "Defined subscriber numbers" FE2 shall send several DEFINE-ACKs to FE3.

Table 19: DEFINE PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0011_2	Definition
Call related DGNA creation	1	1	M	0	Yes
				1	No
Call identifier	14	1	C		See ETS 300 392-2 [4], clause 14, note 1
Defined group identity given	1	1	M	0	Given
				1	Not given
Defined group number type	4	1	C		note 2
Defined group type identifier	2	1	C		Repeatable, note 3
Defined group SNA	8	1	C		Repeatable, note 4
Defined group SSI	24	1	C		Repeatable, note 4
Defined group extension	24	1	C		Repeatable, note 4
Set reference	3	2	O		
Identity owner(s) included	1	2	O	0	Yes
				1	No
Identity owner number type	4	2	C		note 5
Identity owner type identifier	2	2	C		Repeatable, note 3
Identity owner SNA	8	2	C		Repeatable, note 4
Identity owner SSI	24	2	C		Repeatable, note 4
Identity owner extension	24	2	C		Repeatable, note 4
Acknowledged group call	1	2	O	0	Acknowledged
				1	Non-acknowledged
Broadcast	1	2	O	0	Broadcast
				1	Non-broadcast
Number of letters in mnemonic group name	4	2	O		
Mnemonic group name	8	2	C		Repeatable, format defined in ISO 8859-1 [2], note 6

(continued)

Table 19 (concluded): DEFINE PDU contents

Element	Length	Type	C/O/M	Value	Remark
Assignment indication	1	2	O	0	Assignment
				1	No assignment
Affected user number type	4	2	C		note 7
Affected user type identifier	2	2	C		Repeatable, note 3
Affected user SNA	8	2	C		Repeatable, note 4
Affected user SSI	24	2	C		Repeatable, note 4
Affected user extension	24	2	C		Repeatable, note 4
Acknowledgement requested	1	2	O		
Class of usage	3	2	O		
Group Identity Attachment Lifetime	2	2	O		For values, see ETS 300 392-2 [4], clause 16
Temporary assignment	3	2	O		
Proprietary		3	O		

NOTE 1: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element present.
No = 1; element not present.

NOTE 2: Shall be conditional on the value of Defined group identity given:
Given = 0; element present.
Not given = 1; element not present.
The Defined group can only be omitted in case of call related DGNA addition (creation) in which case the SwMI shall allocate the new group identity and return it in the DEFINE-ACK.

NOTE 3: Shall be conditional on the value Defined group/Identity owner/Affected user number type.
If the element Defined group number type is present, this element shall be present.

NOTE 4: Shall be conditional on the value of Defined group/Identity owner/Affected user type identifier (DGTI/IOTI/APTI).
DGTI/IOTI/APTI = 0; Defined group/Identity owner/Affected user SNA.
DGTI/IOTI/APTI = 1; Defined group/Identity owner/Affected user SSI.
DGTI/IOTI/APTI = 2; Defined group/Identity owner/Affected user SSI + Defined group/ identity owner/Affected user extension.
At least one Defined group shall be given.

NOTE 5: Shall be conditional on the value of Identity owner(a) included.
Yes = 0; element present.
No = 1; element not present.

NOTE 6: Shall be conditional on the value of Number of letters in mnemonic group name.
The element shall be present as many times as indicated in the element Number of letters in mnemonic group, if any.

NOTE 7: Shall be conditional on the value of Assignment indication.
Assignment = 0; element present.
No assignment = 1; element not present.

6.5.2 DEFINE-ACK

The DEFINE-ACK information flow, table 20, shall be for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to acknowledge a previously sent call related or call unrelated group definition request.

The value of Result for definition shall be applicable for all groups given in one DEFINE-ACK PDU.

NOTE: If FE3 requested the SS-DGNA definitions to be made to several identities in one definition request, FE2 may send several responses (DEFINE-ACKs).

Table 20: DEFINE-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0011_2	Definition
Call related DGNA creation	1	1	M	0	Yes
				1	No
Call identifier	14	1	C		See ETS 300 392-2 [4], clause 14, note 1
Defined group number type	4	1	M		
Defined group type identifier	2	1	M		Repeatable
Defined group SNA	8	1	C		Repeatable, note 2
Defined group SSI	24	1	C		Repeatable, note 2
Defined group extension	24	1	C		Repeatable, note 2
Result for definition	4	1	M		
Proprietary		3	O		

NOTE 1: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element present.
No = 1; element not present.

NOTE 2: Shall be conditional on the value of Defined group type identifier (DGTI).
DGTI = 0; Defined group SNA.
DGTI = 1; Defined group SSI.
DGTI = 2; Defined group SSI + Defined group extension.
At least one defined group shall be given.

6.5.3 DELETE

The DELETE information flow shall be for the relationship rb, rc and re. The flow shall be sent from FE3 to FE2 or from FE3 to FE2 via FE4. The flow shall be used to delete groups and group parameters from the SwMI and/or deassign (remove) group identities from affected users.

Several groups can be deleted with the same DELETE request, if all the elements and their values shall be deleted/removed from all these groups. E.g. if two different group identities are given as deleted groups in one DELETE PDU that implies that all following elements and their values in the DELETE PDU shall be deleted/removed from both groups, if applicable. If different elements or element values should be deleted/removed, the groups shall be deleted with different DELETE PDUs.

The DELETE information flow elements are described in table 21.

Table 21: DELETE PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	1010_2	Deletion
Deleted group number type	4	1	M		
Deleted group type identifier	2	1	M		Repeatable
Deleted group SNA	8	1	C		Repeatable, note 1
Deleted group SSI	24	1	C		Repeatable, note 1
Deleted group extension	24	1	C		Repeatable, note 1
Group deleted from SwMI	1	1	M	0	Deleted
				1	Not deleted
Removed from affected	1	1	M	0	Removed
users(s)				1	Not removed
Affected user number type	4	2	C		note 2
Affected user type identifier	2	2	C		Repeatable, note 3
Affected user SNA	8	2	C		Repeatable, note 1
Affected user SSI	24	2	C		Repeatable, note 1
Affected user extension	24	2	C		Repeatable, note 1
Acknowledgement requested	1	2	O		
Proprietary		3	O		

NOTE 1: Shall be conditional on the value of Deleted group/Affected user type identifier (DGTI/AUTI).
DGTI/AUTI = 0; Deleted group/Affected user SNA.
DGTI/AUTI = 1; Deleted group/Affected user SSI.
DGTI/AUTI = 2; Deleted group/Affected user SSI + Deleted group/Affected user extension.
At least one Deleted group shall be given.

NOTE 2: Shall be conditional on the value of Removed from affected user(s).
Removed = 0; element present.
Not removed = 1; element not present.

NOTE 3: Shall be conditional on the value Affected user(s) number type. If the element Affected user(s) type is present, this element shall be present.

6.5.4 DELETE-ACK

The DELETE-ACK information flow shall be for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to acknowledge a previously sent deletion and/or removal request to a call related and call unrelated SS-DGNA definition. The acknowledgement may be positive or negative indicating the result of the attempt to delete and/or remove the group number.

Result for deletion/removal shall be applicable to all preceding deleted group identities in the DELETE PDU.

NOTE: If FE3 requested the SS-DGNA deletions to be made to several identities in one deletion request, FE2 may send several responses (DELETE-ACKs).

The DELETE-ACK information flow elements are described in table 22.

Table 22: DELETE-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	1010_2	Deletion
Deleted group number type	4	1	M		
Deleted group type identifier	2	1	M		Repeatable
Deleted group SNA	8	1	C		Repeatable, note
Deleted group SSI	24	1	C		Repeatable, note
Deleted group extension	24	1	C		Repeatable, note
Result for deletion/removal	4	1	M		
Proprietary		3	O		
NOTE: Shall be conditional on the value of Deleted group type identifier (DGTI). DGTI = 0; Deleted Group SNA. DGTI = 1; Deleted Group SSI. DGTI = 2; Deleted Group SSI + Deleted group extension. At least one Deleted group shall be given.					

6.5.5 ASSIGN

The ASSIGN information flow shall be for the relationship ra, rc and rd. The flow shall be sent from FE2 to FE1 or from FE2 to FE1 via FE4. The flow shall be used to add and modify call related and call unrelated SS-DGNA assignments to affected users.

If several groups are assigned with one ASSIGN PDU, the following elements and their values shall be defined and applicable to all the given group identities.

The application should initiate the network authentication procedure before accepting the ASSIGN information flow. The conditions for the initiation of the authentication procedure shall be an operational option. However, when one or more groups with highest class of usage values (7 and 6) are assigned to the affected user, the authentication is recommended.

The ASSIGN information flow elements are described in table 23.

Table 23: ASSIGN PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0001_2	Activation
Assigned group number type	4	1	M		
Assigned group type identifier	2	1	M		Repeatable
Assigned group SNA	8	1	C		Repeatable, note 1
Assigned group SSI	24	1	C		Repeatable, note 1
Assigned group extension	24	1	C		Repeatable, note 1
Acknowledged group call	1	2	O	0	Acknowledged
				1	Non-acknowledged
Broadcast	1	2	O	0	Broadcast
				1	Non-broadcast
Number of letters in mnemonic group name	4	2	O		
Mnemonic group name	8	2	C		Repeatable, format defined in ISO 8859-1 [2], note 2
Acknowledgement requested	1	2	O		
Class of usage	3	2	O		
Group Identity Attachment Lifetime	2	2	O		For values, see ETS 300 392-2 [4], clause 16
Temporary assignment	3	2	O		
Visited system extension	24	2	O		
(V)GSSI	24	3	O		
Proprietary		3	O		

NOTE 1: Shall be conditional on the value of Assigned group type identifier (AGTI).
AGTI = 0; Assigned group SNA.
AGTI = 1; Assigned group SSI.
AGTI = 2; Assigned group SSI + Assigned group extension.
At least one Assigned group shall be given.

NOTE 2: Shall be conditional on the value of Number of letters in mnemonic group name.
The element shall be present as many times as indicated in the element Number of letters in mnemonic group, if any.

6.5.6 ASSIGNING-ACK

The ASSIGNING-ACK information flow shall be for the relationship ra, rc and rd. The flow shall be sent from FE1 to FE2 or from FE1 to FE2 via FE4. The flow shall be used to acknowledge a previously sent addition and modification request of a call related and call unrelated SS-DGNA number to an affected user.

Result for assignment and Attachment/detachment shall be valid for all preceding assigned groups in the ASSIGN-ACK PDU.

NOTE: If Result for assignment and/or Attachment/detachment value is different for different group identities, a separate ASSIGN-ACKs should be sent as acknowledgement to the assignment request.

The ASSIGNING-ACK information flow elements are described in table 24.

Table 24: ASSIGNING-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0001_2	Activation
Assigned group number type	4	1	M		
Assigned group type identifier	2	1	M		Repeatable
Assigned group SNA	8	1	C		Repeatable, note 1
Assigned group SSI	24	1	C		Repeatable, note 1
Assigned group extension	24	1	C		Repeatable, note 1
Result for assignment	2	1	M		
Attachment/detachment	1	2	O	0	Attachment
(note 2)				1	Detachment
Proprietary		3	O		
NOTE 1: Shall be conditional on the value of Assigned group type identifier (AGTI). AGTI = 0; Assigned group SNA. AGTI = 1; Assigned group SSI. AGTI = 2; Assigned group SSI + Assigned group extension. At least one Assigned group shall be given. NOTE 2: Indicates whether the group is used by the affected user as a valid layer 2 address: Attachment = 0: Valid layer 2 address; Detachment = 1: Not valid layer 2 address					

6.5.7 DEASSIGN

The DEASSIGN information flow shall be for the relationship ra, rc and rd. The flow shall be sent from FE2 to FE1 or from FE2 to FE1 via FE4. The flow shall be used to remove groups and group parameters from affected users.

The Acknowledgement requested element, if included, shall be applicable to all preceding deassigned groups in one DEASSIGN PDU.

The application should initiate the network authentication procedure before accepting the DEASSIGN information flow. The conditions for the initiation of the authentication procedure shall be an operational option. However, when one or more groups with highest class of usage values (7 and 6) are deassigned from the affected user, the authentication is recommended.

The DEASSIGN information flow elements are described in table 25.

Table 25: DEASSIGN PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0010_2	Deactivation
Deassigned group number type	4	1	M		
Deassigned group type identifier	2	1	M		Repeatable
Deassigned group SNA	8	1	C		Repeatable, note
Deassigned group SSI	24	1	C		Repeatable, note
Deassigned group extension	24	1	C		Repeatable, note
Acknowledgement requested	1	2	O		
Proprietary		3	O		

NOTE: Shall be conditional on the value of Deassigned group type identifier (DGTI).
DGTI = 0; Deassigned group SNA.
DGTI = 1; Deassigned group SSI.
DGTI = 2; Deassigned group SSI + Deassigned group extension.
At least one Deassigned group shall be given.

6.5.8 DEASSIGNING-ACK

The DEASSIGNING-ACK information flow shall be for the relationship ra, rc and rd. The flow shall be sent from FE1 to FE2 or from FE1 to FE2 via FE4. The flow shall be used to acknowledge a previously sent deassignment (removal) request of a SS-DGNA number, if the acknowledgement was requested in the DEASSIGN information flow.

Result for deassignment shall be valid for all preceding deassigned groups in the DEASSIGN-ACK PDU.

NOTE: If the value of Result for deassignment is different for different group identities, a separate DEASSIGN-ACKs should be sent as acknowledgement to the deassignment request.

The DEASSIGNING-ACK information flow elements are described in table 26.

Table 26: DEASSIGNING-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0010_2	Deactivation
Deassigned group number type	4	1	M		
Deassigned group type identifier	2	1	M		Repeatable
Deassigned group SNA	8	1	C		Repeatable, note
Deassigned group SSI	24	1	C		Repeatable, note
Deassigned group extension	24	1	C		Repeatable, note
Result for definition	4	1	M		

NOTE: Shall be conditional on the value of Deassigned group type identifier (DGTI).
DGTI = 0; Deassigned group SNA.
DGTI = 1; Deassigned group SSI.
DGTI = 2; Deassigned group SSI + Deassigned group extension.
At least one Deassigned group shall be given.

6.5.9 INTERROGATE

The INTERROGATE information flow shall be for the relationship rb, rc and re. The flow shall be sent from FE3/FE1 to FE2 or from FE3/FE1 to FE2 via FE4. The flow shall be used to interrogate group definitions made to the system. The group parameters or the groups created can be interrogated.

The INTERROGATE information flow elements are described in table 27.

Table 27: INTERROGATE PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M		
Interrogated group/user number type	4	1	M		
Interrogated group/user type identifier	2	1	M		Repeatable
Interrogated group/user SNA	8	1	C		Repeatable, note
Interrogated group/user SSI	24	1	C		Repeatable, note
Interrogated group/user extension	24	1	C		Repeatable, note

NOTE: Shall be conditional on the value of Interrogated group/user type identifier (IGTI/IUTI).
IGTI/IUTI = 0; Interrogated Group/User SNA.
IGTI/IUTI = 1; Interrogated Group/User SSI.
IGTI/IUTI = 2; Interrogated Group/User SSI + Interrogated Group/User Extension.
At least one Interrogated group/user shall be given.

6.5.10 INTERROGATE1-ACK

INTERROGATE1-ACK shall be an information flow for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to give a response to a interrogated a SS-DGNA definition.

The interrogation response shall indicate the completion status of the SS-DGNA definition.

Result for interrogation and Result for definition shall be applicable to all preceding interrogated groups in the INTERROGATE1-ACK PDU.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one interrogation request, FE2 may send several responses (INTERROGATE1-ACKs).

The INTERROGATE1-ACK information flow elements are described in table 28.

Table 28: INTERROGATE1-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M	000_2	Completion status of definition
Interrogated group number type	4	1	M		
Interrogated group type identifier	2	1	M		Repeatable
Interrogated group SNA	8	1	C		Repeatable, note 1
Interrogated group SSI	24	1	C		Repeatable, note 1
Interrogated group extension	24	1	C		Repeatable, note 1
Result for interrogation	2	2	M		
Result for definition	4	2	C		note 2
NOTE 1: Shall be conditional on the value of Interrogated user type identifier (IUTI). IUTI = 0; Interrogated user SNA. IUTI = 1; Interrogated user SSI. IUTI = 2; Interrogated user SSI + Interrogated user extension. At least one Interrogated user shall be given. NOTE 2: The element shall appear only if the value of Result for interrogation is "accepted".					

6.5.11 INTERROGATE2-ACK

INTERROGATE2-ACK shall be an information flow for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to give a response to a interrogated a SS-DGNA definition.

The interrogation response shall contain the list of DGNA numbers added/modified by the given user identity (authorized user), if any. Only the last added/modified groups are given, if the authorized user has added/modified more groups than what can be included in the INTERROGATE2-ACK.

The INTERROGATE2-ACK information flow elements are described in table 29.

Table 29: INTERROGATE2-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M	001_2	List of groups added/ modified by the req. user
Interrogated user type identifier	2	1	M		
Interrogated user SNA	8	1	C		note 1
Interrogated user SSI	24	1	C		note 1
Interrogated user extension	24	1	C		note 1
Result for interrogation	2	2	M		
Defined group number type	4	1	O		
Defined group type identifier	2	1	C		Repeatable, note 2
Defined group SNA	8	1	C		Repeatable, note 1
Defined group SSI	24	1	C		Repeatable, note 1
Defined group extension	24	1	C		Repeatable, note 1

NOTE 1: Shall be conditional on the value of Interrogated user/Defined group type identifier (IUTI/DGTI).
IUTI/DGTI = 0; Interrogated user/Defined group SNA.
IUTI/DGTI = 1; Interrogated user/Defined group SSI.
IUTI/DGTI = 2; Interrogated user/Defined group SSI + Interrogated user/Defined group extension.
One Interrogated user shall be given.

NOTE 2: Shall be conditional on the value of Defined group number type. The element can be present and repeated as indicated by Defined group number type.

6.5.12 INTERROGATE3-ACK

INTERROGATE3-ACK shall be an information flow for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to give a response to a interrogated a SS-DGNA definition.

The interrogation response shall contain the list of the defined parameters of the given SS-DGNA number.

The elements for interrogated group shall only be repeated in INTERROGATE3-ACK PDU if all the following elements and their values are common to all preceding interrogated groups.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one interrogation request, FE2 may send several responses (INTERROGATE3-ACKs).

The INTERROGATE3-ACK information flow elements are described in table 30.

Table 30: INTERROGATE3-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M	010_2	Group parameters
Interrogated group number type	4	1	M		
Interrogated group type identifier	2	1	M		Repeatable
Interrogated group SNA	8	1	C		Repeatable, note
Interrogated group SSI	24	1	C		Repeatable, note
Interrogated group extension	24	1	C		Repeatable, note
Result for interrogation	2	2	M		
Set reference	3	3	O		
Identity owner(s) included	1	2	O	0	Yes
				1	No
Identity owner number type	4	2	C		note 2
Identity owner type identifier	2	2	C		Repeatable, note 3
Identity owner SNA	8	2	C		Repeatable, note
Identity owner SSI	24	2	C		Repeatable, note
Identity owner extension	24	2	C		Repeatable, note
Acknowledged group call	1	2	O	0	Acknowledged
				1	Non-acknowledged
Broadcast	1	2	O	0	Broadcast
				1	Non-broadcast
Number of letters in mnemonic group name	4	2	O		
Mnemonic group name	8	2	C		Repeatable, format defined in ISO 8859-1 [2], note 4
Assignment indication	1	2	O	0	Assignment
				1	No assignment
Acknowledgement requested	1	2	O		
Class of usage	3	2	O		
Group Identity Attachment Lifetime	2	2	O		See ETS 300 392-2 [4], clause 16
Temporary assignment	3	2	O		
Proprietary			O		

NOTE 1: Shall be conditional on the value of Defined group/Identity owner type identifier (DGTI/IOTI).
DGTI/IOTI = 0; Defined group/Identity owner SNA.
DGTI/IOTI = 1; Defined group/Identity owner SSI.
DGTI/IOTI = 2; Defined group/Identity owner SSI + Defined group/ Identity owner extension.
At least one Defined group shall be given.

NOTE 2: Shall be conditional on the value of Identity owner(s) included.
Yes = 0; element present.
No = 1; element not present.

NOTE 3: Shall be conditional on the value of Identity owner number type. If the element Identity owner number type is present, this element shall be present.

NOTE 4: Shall be conditional on the value of Number of letters in mnemonic group name.
The element shall be present as many times as indicated in the element Number of letters in mnemonic group, if any.

6.5.13 INTERROGATE4-ACK

INTERROGATE4-ACK shall be an information flow for the relationship rb, rc and re. The flow shall be sent from FE2 to FE1 or from FE2 to FE1 via FE4. The flow shall be used to give a response to a interrogated a SS-DGNA definition.

The interrogation response shall contain the list of the defined parameters for the given SS-DGNA number for affected user. FE1 should update the parameters in the database in MS/LS according to the received parameters, if different from the received ones.

The elements for interrogated group shall only be repeated in INTERROGATE4-ACK PDU if all the following elements and their values are common to all preceding interrogated groups.

NOTE: If FE1 requested the SS-DGNA interrogations of several identities in one interrogation request, FE2 may send several responses (INTERROGATE4-ACKs).

The INTERROGATE4-ACK information flow elements are described in table 31.

Table 31: INTERROGATE4-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M	011_2	Parameters for affected user
Interrogated group number type	4	1	M		
Interrogated group type identifier	2	1	M		Repeatable
Interrogated group SNA	8	1	C		Repeatable, note 1
Interrogated group SSI	24	1	C		Repeatable, note 1
Interrogated group extension	24	1	C		Repeatable, note 1
Result for interrogation	2	2	M		
Acknowledged group call	1	2	O	0	Acknowledged
				1	Non-acknowledged
Broadcast	1	2	O	0	Broadcast
				1	Non-broadcast
Number of letters in mnemonic group name	4	2	O		
Mnemonic group name	8	2	C		Repeatable, format defined in ISO 8859-1 [2], note 2
Class of usage	3	2	O		
Group Identity Attachment Lifetime	2	2	O		For values, see ETS 300 392-2 [4], clause 16
Temporary assignment	3	2	O		
Proprietary			O		

NOTE 1: Shall be conditional on the value of Interrogated group type identifier (IGTI).
IGTI = 0; Interrogated group SNA.
IGTI = 1; Interrogated group SSI.
IGTI = 2; Interrogated group SSI + Interrogated group extension.
At least one Interrogated user shall be given.

NOTE 2: Shall be conditional on the value of Number of letters in mnemonic group name.
The element shall be present as many times as indicated in the element Number of letters in mnemonic group, if any.

6.5.14 INTERROGATE5-ACK

INTERROGATE5-ACK shall be an information flow for the relationship rb, rc and re. The flow shall be sent from FE2 to FE3 or from FE2 to FE3 via FE4. The flow shall be used to give a response to a interrogated a SS-DGNA definition.

The interrogation response shall contain a list of affected users that are assigned the given SS-DGNA and whether the user has acknowledged the assignment.

The elements for interrogated group shall only be repeated in INTERROGATE5-ACK PDU if all the following elements and their values are common to all preceding interrogated groups.

NOTE: If FE3 requested the SS-DGNA interrogations of several identities in one interrogation request, FE2 may send several responses (INTERROGATE5-ACKs).

The INTERROGATE5-ACK information flow elements are described in table 32.

Table 32: INTERROGATE5-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0101_2	Interrogation
Interrogation type	3	1	M	100_2	List of affected users
Interrogated group number type	4	1	M		
Interrogated group type identifier	2	1	M		Repeatable
Interrogated group SNA	8	1	C		Repeatable, note 1
Interrogated group SSI	24	1	C		Repeatable, note 1
Interrogated group extension	24	1	C		Repeatable, note 1
Result for interrogation	2	2	M		
Assignment indication	1	2	O	0	Assignment
				1	No assignment
Acknowledgement requested	1	2	O		
Affected user number type	4	2	C		note 2
Affected user type identifier	2	2	C		Repeatable, note 3
Affected user SNA	8	2	C		Repeatable, note 2
Affected user SSI	24	2	C		Repeatable, note 2
Affected user extension	24	2	C		Repeatable, note 2
Acknowledgement type	1	2	C		Repeatable, note 4

NOTE 1: Shall be conditional on the value of Interrogated user/Affected user type identifier (IUTI/AUTI).
IUTI/AUTI = 0; Interrogated group/Affected user SNA.
IUTI/AUTI = 1; Interrogated group/Affected user SSI.
IUTI/AUTI = 2; Interrogated group/affected user SSI + Interrogated group/affected user extension.
At least one Interrogated group shall be given.

NOTE 2: Shall be conditional on the value of Assignment indication.
Assignment = 0; element present.
No assignment = 1; element not present.

NOTE 3: Shall be conditional on the value Affected user(s) type. If the element Affected user(a) type is present, this element shall be present.

NOTE 4: Shall be conditional on the element of Acknowledgement requested. Element shall be present if the element Acknowledgement requested is present. The element shall be repeated after each subscriber number indicating whether the assignment for that subscriber number has been acknowledged.

6.5.15 CANCEL

CANCEL information flow, table 33, is offered from FE2 to FE3. The flow is offered from FE2 to FE3 via FE4 if FE3 is in another TETRA system.

Table 33: CANCEL PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0110_2	Cancellation
Call related DGNA creation	1	1	M	0	Yes
				1	No
Call identifier	14	1	C		See ETS 300 392-2 [4], clause 14, note 1
Defined group type identifier	2	1	C		note 2
Defined group SNA	8	1	C		note 3
Defined group SSI	24	1	C		note 3
Defined group extension	24	1	C		note 3
Existing group type identifier	2	1	M		
Existing group SNA	8	1	C		note 3
Existing group SSI	24	1	C		note 3
Existing group extension	24	1	C		note 3

NOTE 1: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element present.
No = 1; element not present.

NOTE 2: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element not present.
No = 1; element present.

NOTE 3: Shall be conditional on the value of Defined group/Existing group type identifier (DGTI/EGTI).
DGTI/EGTI = 0; Defined group/Existing group SNA.
DGTI/EGTI = 1; Defined group/Existing group SSI.
DGTI/EGTI = 2; Defined group/Existing group SSI + Defined group/Existing group extension.

6.5.16 CANCEL-ACK

CANCEL-ACK information flow, table 34, is offered from FE2 to FE3. The flow is offered from FE2 to FE3 via FE4 if FE3 is in another TETRA system.

CANCEL-ACK shall contain the following SS-DGNA information.

Table 34: CANCEL-ACK PDU contents

Element	Length	Type	C/O/M	Value	Remark
SS-Type	6	1	M	010100_2	DGNA
Action type	4	1	M	0110_2	Cancellation
Call related DGNA creation	1	1	M	0	Yes
				1	No
Call identifier	14	1	C		See ETS 300 392-2 [4], clause 14, note 1
Defined group type identifier	2	1	C		note 2
Defined group SNA	8	1	C		note 3
Defined group SSI	24	1	C		note 3
Defined group extension	24	1	C		note 3
Result for cancellation	1	1	M	0	Cancelled
				1	Not cancelled

NOTE 1: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element present.
No = 1; element not present.
NOTE 2: Shall be conditional on the value of Call related DGNA creation.
Yes = 0; element not present.
No = 1; element present.
NOTE 3: Shall be conditional on the value of Defined group type identifier (DGTI).
DGTI = 0; Defined group SNA.
DGTI = 1; Defined group SSI.
DGTI = 2; Defined group SSI + Defined group extension.

6.6 Element coding

6.6.1 Acknowledgement requested

Acknowledgement requested shall indicate that the affected user shall send an acknowledgement indicating the result of DGNA number assignment/deassignment. If the element is present it shall indicate, that the user shall acknowledge the request. The element is described in table 35.

Table 35: Acknowledgement requested contents

Element	Length	Value	Remark
Acknowledgement requested	1	0	Requested
		1	Reserved

6.6.2 Acknowledgement type

Acknowledgement type shall indicate if the assignment has been or has not been successfully delivered to the affected user. If the assignment has not been successfully delivered, it should indicate: the assignment have been rejected by the affected user for any reason or the affected user has not been successfully reached. The element is described in table 36.

Table 36: Acknowledgement type contents

Element	Length	Value	Remark
Acknowledgement type	1	0	Assignment accepted
		1	Assignment not accepted/completed

6.6.3 Action type

Action type shall indicate the type of the action as described in table 37. With SS-DGNA the following Action types are applied:

- Activation: ASSIGN, ASSIGN-ACK;
- Deactivation: DEASSIGN, DEASSIGN-ACK;
- Definition: DEFINE, DEFINE-ACK;
- Interrogation: INTERROGATE, INTERROGATE1/2/3/4/5-ACK;
- Cancellation: CANCEL, CANCEL-ACK;
- Deletion: DELETE, DELETE-ACK.

Table 37: Action type contents

Element	Length	Value	Remark
Action type	4	0000_2	SS-Service not supported
		0001_2	Activation
		0010_2	Deactivation
		0011_2	Definition
		0100_2	Registration
		0101_2	Interrogation
		0110_2	Cancellation
		0111_2	Invocation
		1000_2	Information
		1001_2	Operation
		1010_2	Deletion
		1011_2	Reserved
		...	etc.
		1111_2	Reserved

6.6.4 Affected user extension

The purpose of the Affected user extension element shall be to indicate to the SwMI the extended part of the TSI address of the affected user. The element is described in table 38.

Table 38: Affected user extension element contents

Element	Length	Value	Remark
Country Code	10		See ETS 300 392-1 [5] clause 7.
Network Code	14		See ETS 300 392-1 [5] clause 7.

6.6.5 Affected user number type

Affected user number type shall indicate if following "Affected subscriber number" element set shall appear once, shall appear twice indicating a range or shall appear 2-10 times indicating a list. So, the element shall also indicate how many "Affected subscriber number" element sets are following.

One "Affected subscriber number" element set shall include all elements of one of the following:

- Affected user type identifier and Affected user SNA;

- Affected user type identifier and Affected user SSI;

- Affected user type identifier, Affected user SSI and Affected user extension.

Affected user number type element is described in table 39.

Table 39: Affected user number type contents

Element	Length	Value	Remarks
Affected user number type	4	0000_2	Subscriber number, 1
		0001_2	Range of subscriber numbers, 2
		0010_2	List of subscriber numbers, 2
		0011_2	List of subscriber numbers, 3
		0100_2	List of subscriber numbers, 4
		0101_2	List of subscriber numbers, 5
		0110_2	List of subscriber numbers, 6
		0111_2	List of subscriber numbers, 7
		1000_2	List of subscriber numbers, 8
		1001_2	List of subscriber numbers, 9
		1010_2	List of subscriber numbers, 10
		1011_2	Reserved
		...	etc.
		1111_2	Reserved
NOTE: The number in Remark column indicates how many Subscriber number elements shall be present.			

6.6.6 Affected user SNA

The purpose of the Affected user SNA element shall be to indicate to the SwMI the Short Number address of the Defined user. The SNA shall refer to a short number defined for the FE3, that made the definition or requested it. FE2 shall replace the SNA in the definition saved to database in SwMI by the complete TETRA subscriber identity (ISSI/GSSI). The element is described in table 40.

Table 40: Affected user SNA element contents

Element	Length	Value	Remark
Affected user SNA	8	$0\text{-}255_{10}$	See ETS 300 392-1 [5], clause 7.

6.6.7 Affected user SSI

The purpose of the Affected user SSI element shall be to indicate to the SwMI the SSI address of the Defined user. The element is described in table 41.

Table 41: Affected User SSI element contents

Element	Length	Value	Remark
Affected user SSI	24		See ETS 300 392-1 [5], clause 7.

6.6.8 Affected user type identifier

The purpose of the Affected user type identifier element shall be to indicate the type of address which shall follow in the PDU. The element is described in table 42.

Table 42: Affected user type identifier element contents

Element	Length	Value	Remark
Affected user type identifier	2	00_2	Short Number Address (SNA)
		01_2	Short Subscriber Identity (SSI)
		10_2	TETRA Subscriber Identity (TSI)
		11_2	Reserved.

6.6.9 Assigned group extension

See Affected user extension.

6.6.10 Assigned user number type

See Affected user number type.

6.6.11 Assigned group SNA

See Affected user SNA.

6.6.12 Assigned group SSI

See Affected user SSI.

6.6.13 Assigned group type identifier

See Affected User Type Identifier.

6.6.14 Class of usage

Shall indicate the importance of the group for the affected user and therefore define the participation rules for the groups defined with Class of usage.

The definitions for the different class of usage values shall be:

7: Highest class of usage value. Affected user should always join an invoked call with this value;

6: MS/LS locked from SwMI. Affected user should always join the call with value 6 (except if value 7 call is ongoing for a group the affected user is member of). Affected user shall not join circuit mode calls with lower class of usage than 6, if the value 6 is defined for any group in MS/LS;

5-2: Calls prioritized according to the class of usage value. If user has several groups with Class of usage values 2-5, affected user shall join the ongoing circuit mode call with highest priority. However, only if no locking value (6) group is defined or if there is not any ongoing circuit mode group call with class of usage value 7;

1-0: Affected user shall not join circuit mode calls with this Class of usage, however, he shall receive SDS calls.

The definitions above shall apply only for groups that are used as valid layer 2 addresses.

The possible element values are described in table 43.

Table 43: Class of usage contents

Element	Length	Value	Remarks
Class of usage	3	000_2	0
		001_2	1
		010_2	2
		011_2	3
		100_2	4
		101_2	5
		110_2	6
		111_2	7

6.6.15 Deassigned group extension

See Affected user extension.

6.6.16 Deassigned group number type

See Affected user number type.

6.6.17 Deassigned group SNA

See Affected user SNA.

6.6.18 Deassigned group SSI

See Affected user SSI.

6.6.19 Deassigned group type identifier

See Affected user type identifier.

6.6.20 Deleted group extension

See Affected user extension.

6.6.21 Deleted group number type

See Affected user number type.

6.6.22 Deleted group SNA

See Affected user SNA.

6.6.23 Deleted group SSI

See Affected user SSI.

6.6.24 Deleted group type identifier

See Affected user type identifier.

6.6.25 Defined group extension

See Affected user extension.

6.6.26 Defined group number type

See Affected user number type.

6.6.27 Defined group SNA

See Affected user SNA.

6.6.28 Defined group SSI

See Affected user SSI.

6.6.29 Defined group type identifier

See Affected user type identifier.

6.6.30 Existing group extension

See Affected user extension.

6.6.31 Existing group SNA

See Affected user SNA.

6.6.32 Existing group SSI

See Affected user SSI.

6.6.33 Existing group type identifier

See Affected user type identifier.

6.6.34 Identity owner extension

See Affected user extension.

6.6.35 Identity owner number type

See Affected user number type.

6.6.36 Identity owner SNA

See Affected user SNA.

6.6.37 Identity owner SSI

See Affected user SSI.

6.6.38 Identity owner type identifier

See Affected user type identifier.

6.6.39 Interrogated group extension

See Affected user extension.

6.6.40 Interrogated group number type

See Affected user number type.

6.6.41 Interrogated group SNA

See Affected user SNA.

6.6.42 Interrogated group SSI

See Affected user SSI.

6.6.43 Interrogated group type identifier

See Affected user type identifier.

6.6.44 Interrogated user extension

See Affected user extension.

6.6.45 Interrogated user number type

See Affected user number type.

6.6.46 Interrogated user SNA

See Affected user SNA.

6.6.47 Interrogated user SSI

See Affected user SSI.

6.6.48 Interrogated user type identifier

See Affected user type identifier.

6.6.49 Interrogation type

Interrogation type shall indicate the type of the interrogation. The element is described in table 44.

Table 44: Interrogation type contents

Element	Length	Value	Remarks
Interrogation type	3	000_2	Completion status of definition.
		001_2	List of groups added/modified by the requesting user
		010_2	Group parameters
		011_2	Group parameters for affected user
		100_2	List of affected users
		101_2	Reserved
		110_2	Reserved
		111_2	Reserved

6.6.50 Number of letters in mnemonic group name

Shall indicate how many letters shall be in the following mnemonic group name. The element is described in table 45.

Table 45: Number of letters in mnemonic group name

Element	Length	Value	Remarks
Number of letters in mnemonic group name	4	0000_2	1
		0001_2	2
		0010_2	3
		0011_2	4
		... etc.	... etc.
		1111_2	16

6.6.51 Proprietary

Proprietary is an optional, variable length element and shall be used to send and receive proprietary defined information appended to the PDUs.

The use, the size and the structure of the Proprietary element is outside the scope of this ETS.

6.6.52 Result for assignment

Result for assignment request shall indicate the result for previously sent request. The element is described in table 46.

Table 46: Result for assignment contents

Element	Length	Value	Remark
Result for assignment	2	00_2	Accepted
		01_2	Rejected for any reason
		10_2	Network authentication failure
		11_2	Subscriber database overflow

6.6.53 Result for deassignment

See Result for assignment request. Subscriber database overflow value applied for assignment is replaced by "Unknown group" in case of deassignment.

6.6.54 Result for definition

Result for definition shall indicate whether the previously made definition request was successful or unsuccessful. Result for definition element is described in table 47.

Table 47: Contents for Result for definition

Element	Length	Value	Remark
Result for definition	4	0000_2	accepted by SwMI or accepted by MS (note 1)
		0001_2	accepted but parameter(s) changed by SwMI (note 2)
		0010_2	request failed for any reason
		0011_2	user not authorized
		0100_2	unknown TETRA identity
		0101_2	not valid DGNA identity (note 3)
		0110_2	parameters not valid
		0111_2	insufficient information
		1000_2	group definition accepted, but one or more affected users could not accept the request/one or more affected users where not reached (note 4)
		1001_2	group deletion accepted, but one or more affected users where not reached (note 4)
		1010_2	Reserved.
		... etc.	... etc.
		0111_2	Reserved.
NOTE 1: "accepted by SwMI" can be applied only for DEFINE/DELETE acknowledgement; "accepted by MS" can be applied only for ASSIGN/DEASSING acknowledgement. NOTE 2: Applicable only for DEFINE acknowledgement. NOTE 3 Applicable also when a group has been deleted (and group definition removed.) NOTE 4: Applicable only for interrogation of "Completion status of definition".			

6.6.55 Result for deletion/removal

See Result for definition.

6.6.56 Result for interrogation

Result for interrogation request shall indicate the result for previously sent interrogation request. The element is described in table 48.

Table 48: Result for interrogation request contents

Element	Length	Value	Remark
Result for interrogation request	2	00_2	accepted
		01_2	user not authorized
		10_2	parameters not valid
		11_2	request failed for any reason

6.6.57 Set reference

Reference to a pre-defined parameter set, which shall be recognized by SwMI, if used. Any defined parameter in DEFINE request shall override a pre-defined parameter. The element is described in table 49.

Table 49: Set reference

Element	Length	Value	Remarks
Set reference	3	000_2	Set 1
		001_2	Set 2
		010_2	Set 3
		011_2	Set 4
		100_2	Set 5
		101_2	Set 6
		110_2	Set 7
		111_2	Set 8

6.6.58 Temporary assignment

The element shall indicate that the group definition shall be valid only for the time indicated. However, during an ongoing call the timer shall be ignored and the timer shall be set at call release.

A pre-defined value is out of the scope of this standard and it shall be known to SwMI, MS and LS, if used. The element is described in table 50.

Table 50: Temporary assignment

Element	Length	Value	Remarks
Temporary definition	3	000_2	Pre-defined value
		001_2	1 minute
		010_2	2 minutes
		011_2	5 minutes
		100_2	10 minutes
		101_2	20 minutes
		110_2	30 minutes
		111_2	60 minutes

6.6.59 Visited system extension

The element shall indicate the Visited system extension. The element shall be applied in the Visited system, if the affected user is located in that (Visited) system.

For element coding, see Affected user extension.

6.6.60 Visitor Group Short Subscriber Identity (V)GSSI

The element shall indicate the (V)GSSI,. The element shall be applied in the Visited system, if the affected user is located in that (Visited) system.

For element coding, see Affected user SSI.

7 SS-DGNA Functional entity behaviour

The figures contained in this clause are intended to illustrate typical SS-DGNA specific 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 CCITT Recommendation Z.100 [6]. Notice, however, that due to simplicity there are deviations from syntactical rules.

The convention used in the figures below is that output signals to the left represent information towards the user and output signals to the right represents information flows towards the SwMI part of the DGNA function. Input signals from the left represent information flows from the user and input signals from the right represent information flows from the central part of the SwMI.

7.1 Behaviour of FE1

7.1.1 Service interaction for FE1 (SS entity in affected user)

Service interaction for FE1 (SS entity in affected user) is show in figure 6.

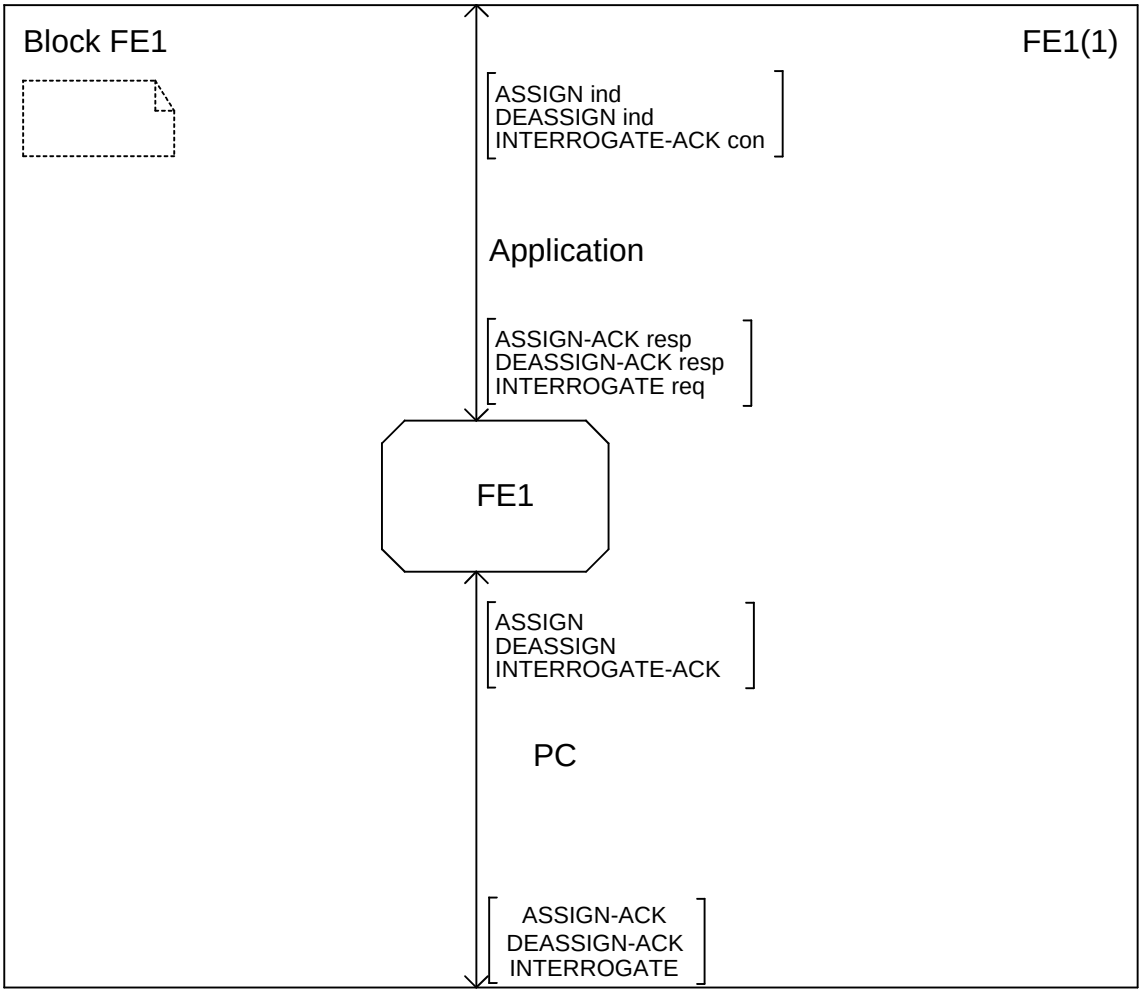


Figure 6: Service interaction for FE1

NOTE: In case of interrogation, INTERROGATE4-ACK is applicable for FE1.

7.1.1.1 Process description of FE1 (SS entity in affected user)

Process description of FE1 (SS entity in affected user) in state IDLE is given in figure 7.

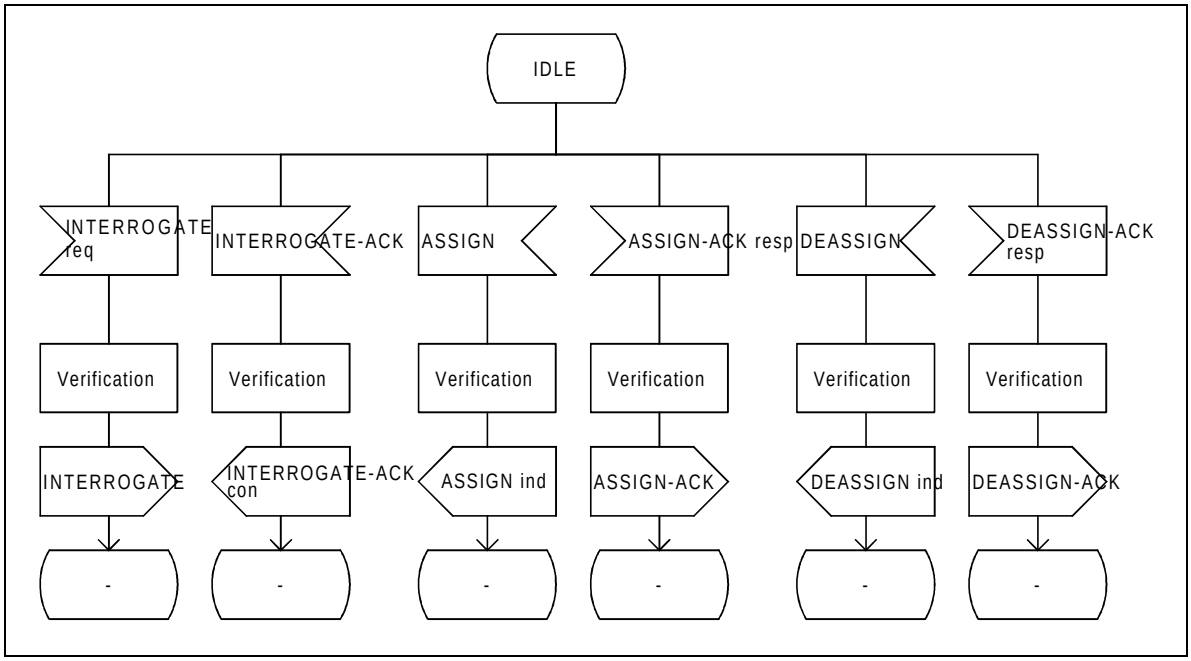


Figure 7: Process description of FE1

NOTE: In case of interrogation, INTERROGATE4-ACK is applicable for FE1.

7.2 Behaviour of FE2

7.2.1 Service interaction for FE2 (SS entity in SwMI in system 1)

Service interaction for FE2 (SS entity in SwMI in system 1) is shown in figure 8.

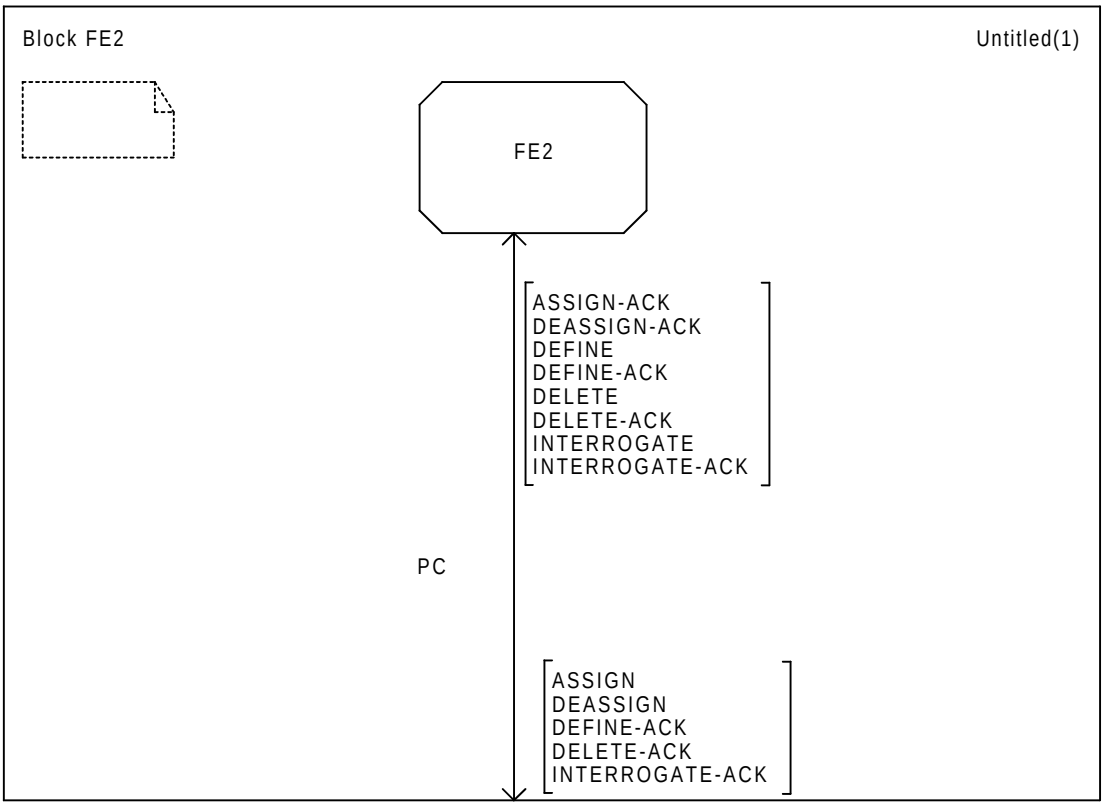


Figure 8: Service interaction for FE2

7.2.2 Process description of FE2 (SS entity in SwMI)

Process description of FE2 (SS entity in SwMI) for state IDLE is shown in figure 9.

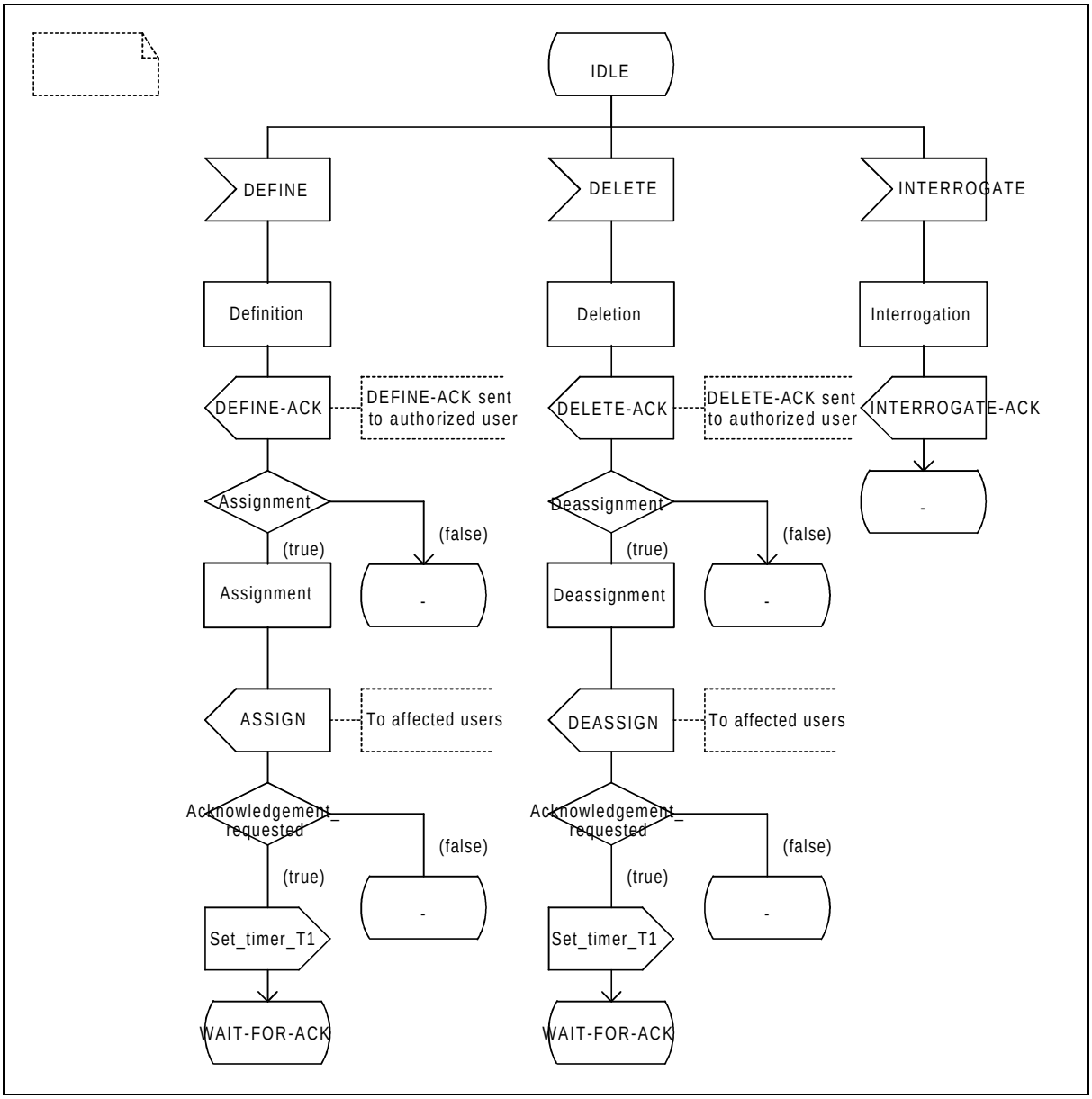


Figure 9: Process description of state IDLE of FE2

Process description of FE2 (SS entity in SwMI) for state WAIT-FOR-ACK is shown in figure 10.

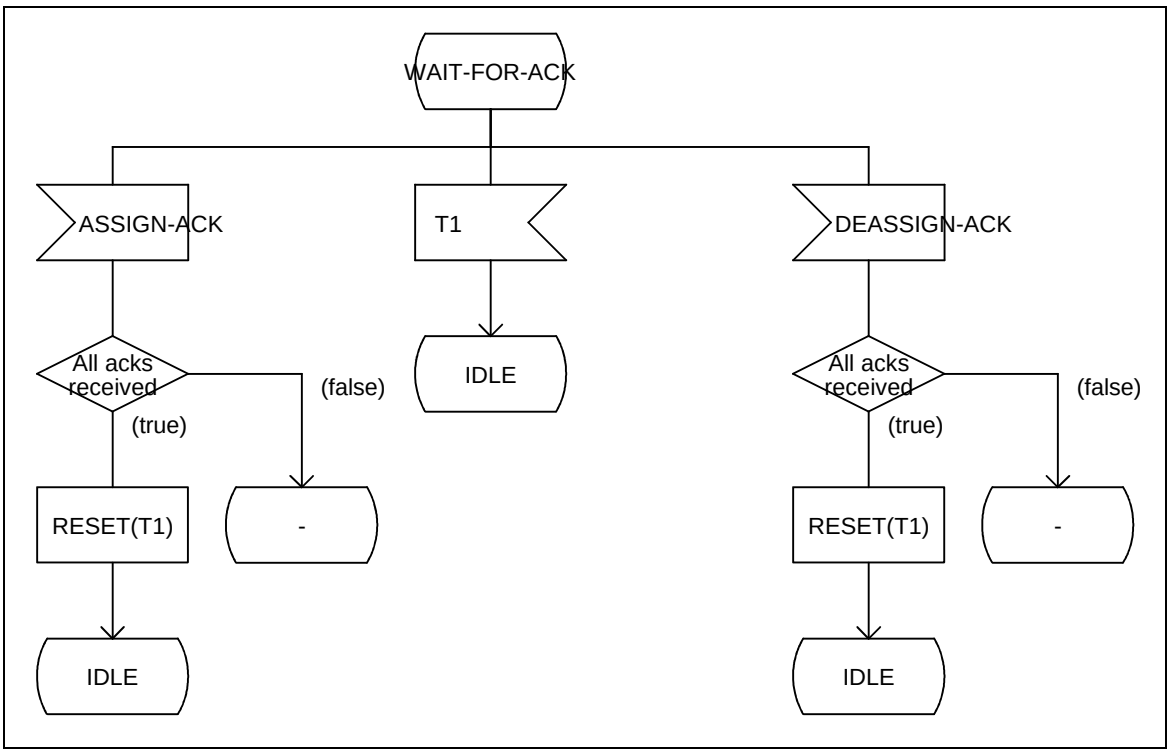


Figure 10: Process description of state WAIT-FOR-ACK of FE2

NOTE: Any of the SS-DGNA information flows, in figures 9 and 10 can be received and sent from a user in the same system or from a user in another system and via FE4. The figures describe the situation where authorized and affected user are in the same system than FE2. If a user would be in another system the information flows would come via FE4 and the signals would be pointing to another direction. In order to avoid repetition, all the possibilities are not shown.

7.3 Behaviour of FE3

7.3.1 Service interaction for FE3 (SS entity in authorized user)

Service interaction for FE3 (SS entity in authorized user) is shown in figure 11.

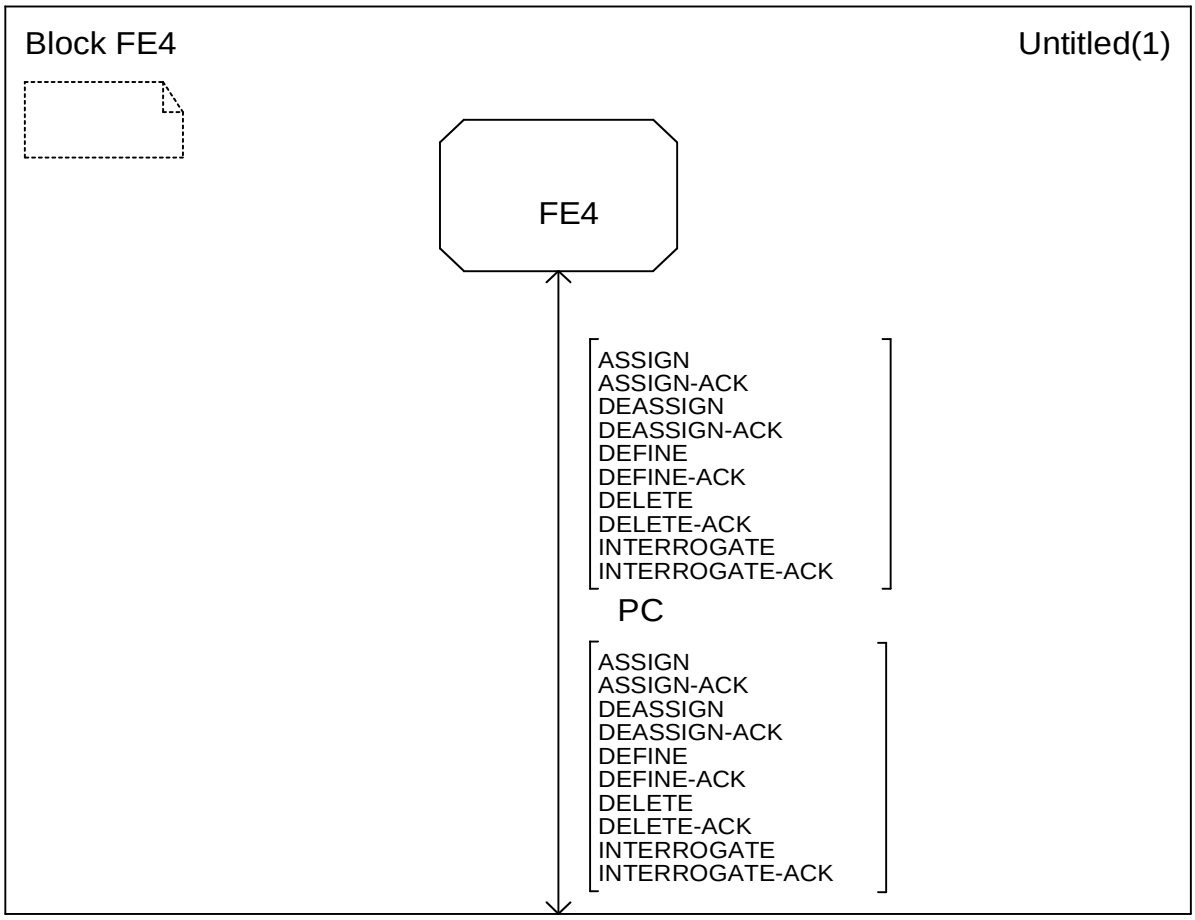


Figure 11: Service interaction for FE3

NOTE: In case of interrogation, INTERROGATE1-ACK, INTERROGATE2-ACK, INTERROGATE3-ACK and INTERROGATE5-ACK are applicable for FE3.

7.3.2 Process description of FE3 (SS entity in authorized user)

Process description of FE3 (SS entity in authorized user) for state IDLE is shown in figure 12 and 13.

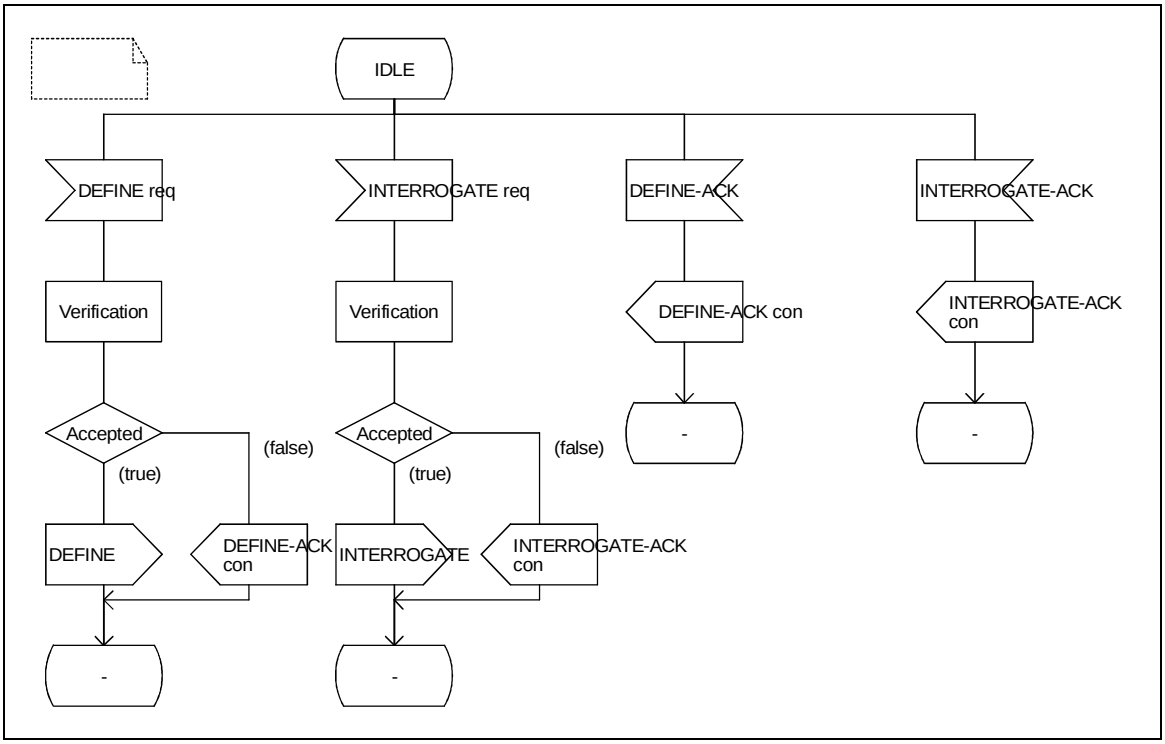


Figure 12: Process description of FE3

NOTE: In case of interrogation, INTERROGATE1-ACK, INTERROGATE2-ACK, INTERROGATE3-ACK and INTERROGATE5-ACK are applicable for FE3.

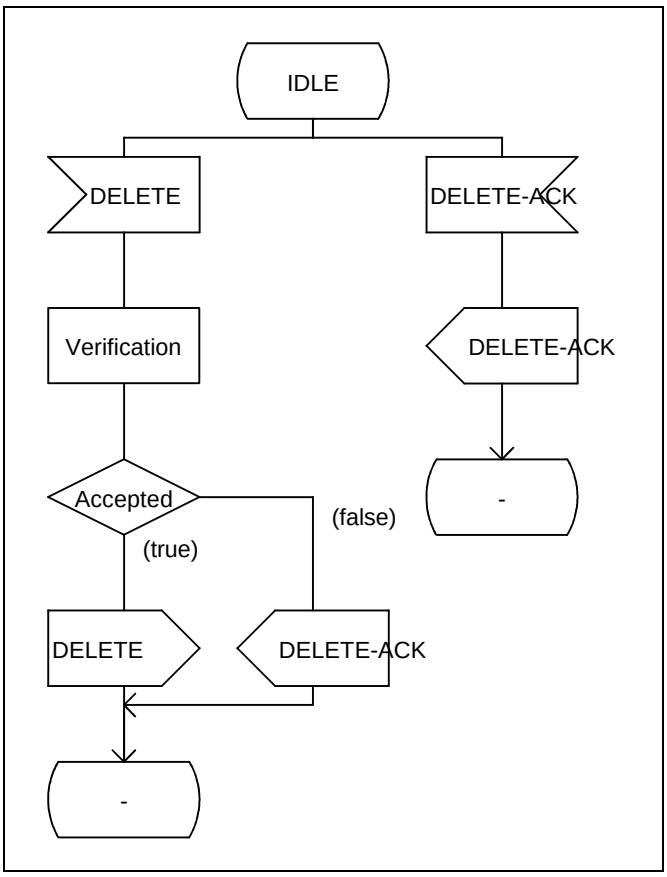


Figure 13: Process description of FE3

7.4 Behaviour of FE4

7.4.1 Service interaction for FE4 (SS entity in SwMI in system 2)

Service interaction for FE4 (SS entity in SwMI in system 2) is shown in figure 14.

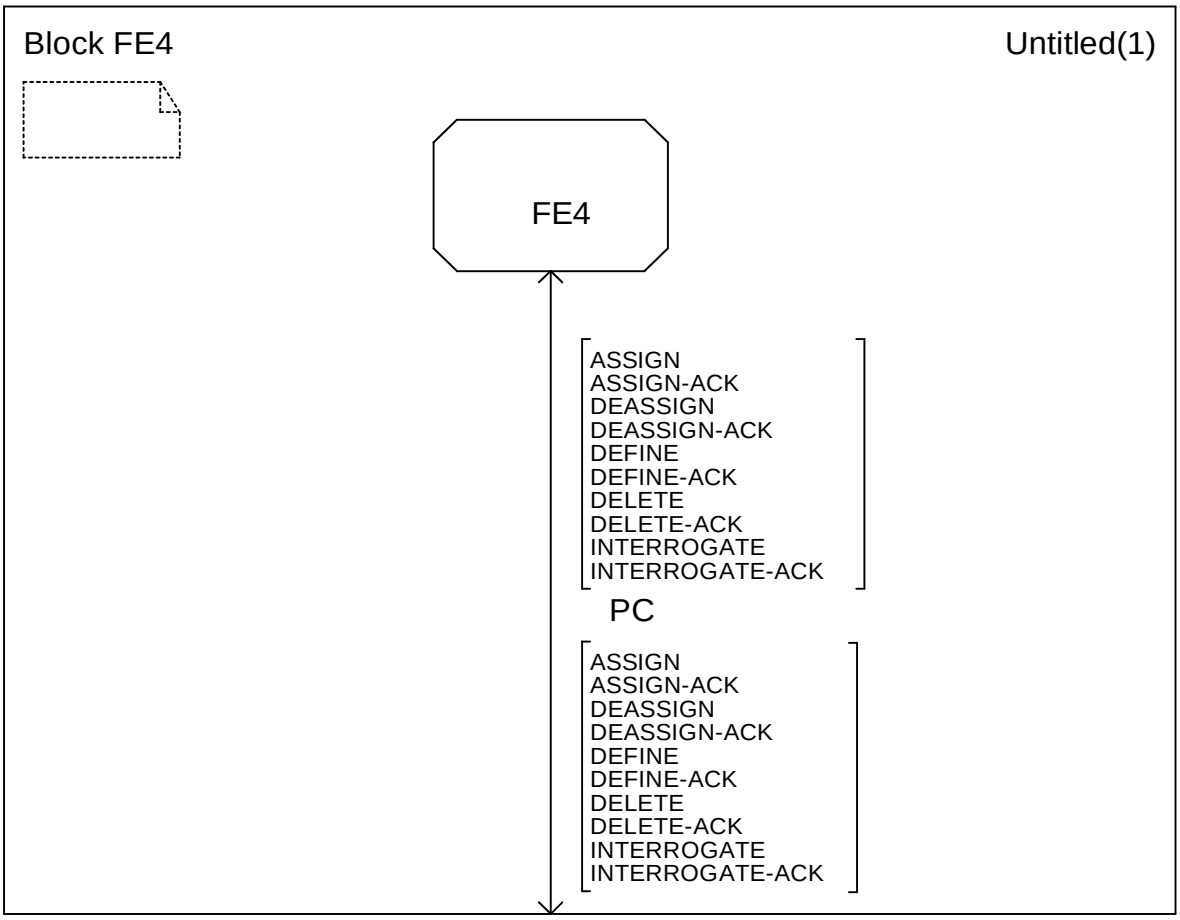


Figure 14: Service interaction for FE4

7.4.2 Process description of FE4 (SS entity in SwMI in system 2)

Process description of FE4 (SS entity in SwMI in system 2) for state IDLE is shown in figure 15 and 16.

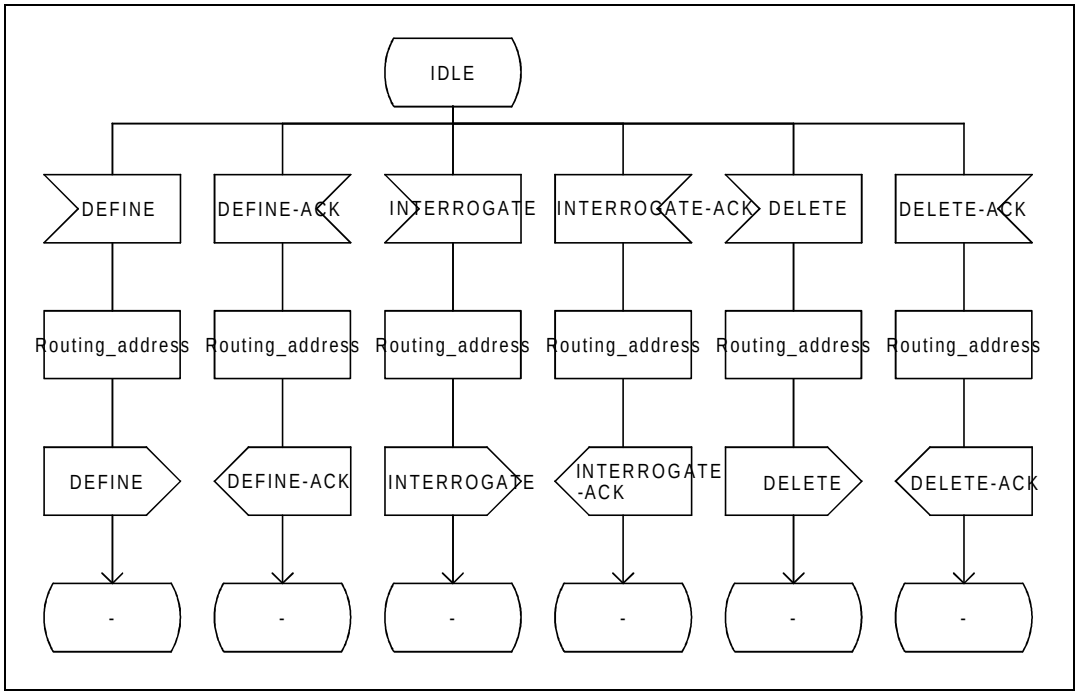


Figure 15: Process description of state IDLE of FE4

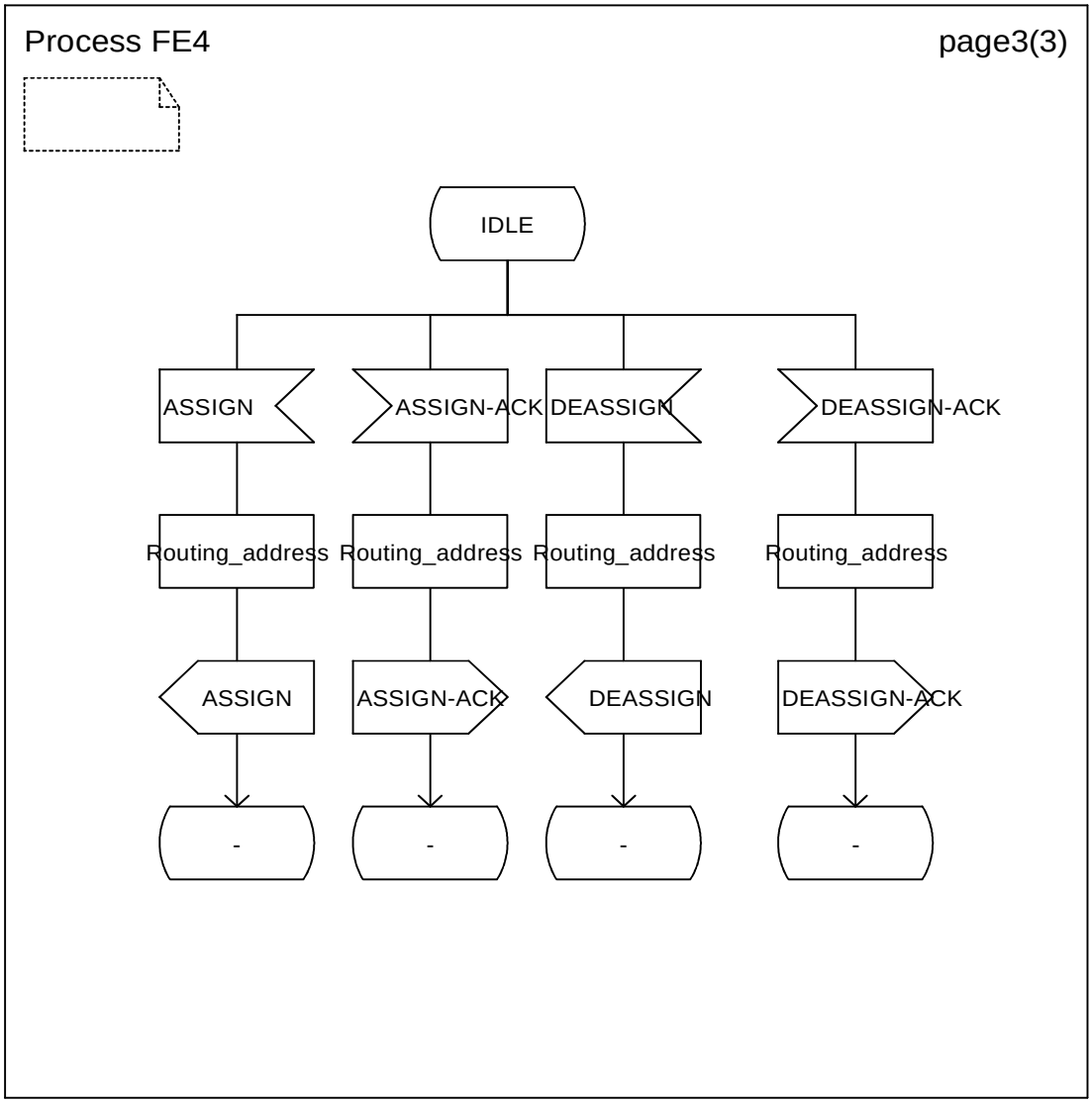


Figure 16: Process description of state IDLE of FE4, continued

7.5 Inter-working considerations

In order to enable the SS-DGNA to extend to several TETRA systems over the ISI, the FE2s and FE4s in different TETRA systems shall be able to send and receive call related and call unrelated Supplementary Service information flows over the ISI.

Annex A (informative): Examples of SS-FACILITY elements

A.1 Example of DEFINE SS-FACILITY element contents

EXAMPLE: An example of the contents in a SS-DGNA DEFINE FACILITY element.

Table A.1 gives an example of the elements in a SS-DGNA DEFINE facility element that FE3 shall construct. It describes a definition made to a list of two group numbers, two of type SSI numbers. The defined SS-DGNA number is assigned a class of usage value "5" and the group is meant to be used for broadcast calls. The definition is sent to three subscribers. The first affected user number is a SNA, the second number is a SSI and the third number is a TSI. The affected users are requested to acknowledge the assignment request.

Table A.1: An example of the contents in a SS-DGNA DEFINE FACILITY element sent by FE3

SS-Type (~ SS-DGNA)
Action Type (~ Definition)
Call related DGNA creation (~ 1, no)
Defined group identity given (~ 0, given)
Defined group number type (~ list, 2)
Defined group type identifier (~ DGTI = 1 = SSI)
Defined group SNA (~ the SSI form a subscriber. number)
Defined group type identifier (~ DGTI = 1 = SSI)
Defined group SNA (~ the SSI form a subscriber number)
Broadcast (~ Broadcast)
Assignment indication (~ Assignment)
Affected user number type (~ list, 3)
Affected user type identifier (~ AUTI = 0 = SNA)
Affected user SNA (~ the SNA form a subscriber number)
Affected user type identifier (~ DGTI = 1 = SSI)
Affected user SSI (~ the SSI form a subscriber number)
Affected user type identifier (~ DGTI = 2 = SSI + Extension, TSI)
Affected user SSI (~ the SSI form of a subscriber number)
Affected user extension (~ Country Code + Network Code)
Acknowledgement requested (~ requested)
Class of usage (~ 5)

A.2 Example of ASSIGN SS-FACILITY element contents

EXAMPLE: An example of the contents in a SS-DGNA ASSIGN FACILITY element.

Table A.2 gives an example of an assignment to affected user. The group number is given as SSI number and the class of usage value used for the group should be "4". The acknowledgement for the assignment is requested from FE1.

Table A.2: An example of the contents in a SS-DGNA ASSIGN FACILITY element

SS-Type (~ SS-DGNA)
Action Type (~ Activation)
Assigned group number type (~ subscriber (group) number, 1)
Assigned group type identifier (~ AGTI = 1 = SSI)
Assigned group SSI (~ the SSI form a subscriber number)
Class of usage (~ 4)

A.3 Example of INTERROGATE SS-FACILITY element contents

EXAMPLE 1: Example of the contents in a SS-DGNA INTERROGATE Facility for interrogate the group parameters sent by authorized user.

Table A.3 gives an example of the request for group parameters made by the authorized user. The interrogated group number is a SNA number defined for the authorized user.

Table A.3: An example of the contents in a SS-DGNA INTERROGATE FACILITY element

SS-Type (~ SS-DGNA)
Action Type (~ Interrogation)
Interrogation type (~ Group parameters for authorized user)
Interrogated group number type (~ subscriber (group) number, 1)
Interrogated group type identifier (~ IGTI = 0 = SNA)
Interrogated group SNA (~ the SNA form a subscriber number)

EXAMPLE 2: An example of the contents in a SS-DGNA INTERROGATE Facility element to request the acknowledgements sent by affected users

Table A.4 gives an example of the request for acknowledgements sent by the affected users for assignment requests. The interrogated group number is a SSI number.

Table A.4: An example of the contents in a SS-DGNA INTERROGATE FACILITY element

SS-Type (~ SS-DGNA)
Action Type (~ Interrogation)
Interrogation type (~ Group parameters for authorized user)
Interrogated group number type (~ group number, 1)
Interrogated group type identifier (~ DGTI = 1 = SSI)
Interrogated group SSI (~ the SSI form a subscriber number)

A.4 Example of INTERROGATE SS-FACILITY element contents

EXAMPLE: An example of the contents in a SS-DGNA INTERROGATE Facility element.

Table A.5 gives an example of a DGNA interrogation for the group parameters for affected user. The affected user has requested the parameters for two groups. The group number type of the first group is SNA and the second is a SSI number.

Table A.5: An example of the contents in a SS-DGNA INTERROGATE-ACK FACILITY element sent by FE1

SS-Type (~ SS-DGNA)
Action Type (~ Interrogation)
Interrogation type (~ Group parameters for affected user)
Interrogated group number type (~ list, 2)
Interrogated group type identifier (~ DGTI = 0 = SNA)
Interrogated group SNA (~ the SNA form a subscriber number)
Interrogated group type identifier (~ DGTI = 1 = SSI)
Interrogated group SSI (~ the SSI form a subscriber number)

A.5 Example of INTERROGATE-ACK SS-FACILITY element contents

EXAMPLE: Example of the contents in a SS-DGNA INTERROGATE4-ACK facility element.

Table A.6 and A.7 gives examples of INTERROGATE facility elements sent by the authorized user. E.g. the user has requested the interrogation for a list of two subscriber numbers, and the request is accepted for one subscriber number (SNA type) but the request is rejected for the other (SSI type), FE2 should send two separate acknowledgements back to FE3, see tables 6 and 7. The first response for the accepted interrogation includes the mnemonic name for the group and the class of usage value used for the group.

Table A.6: An example of the contents in a SS-DGNA INTERROGATE4-ACK FACILITY element, when the interrogation is accepted for a group number

SS-Type (~ SS-DGNA)
Action Type (~ Interrogation)
Interrogation type (~ Group parameters for affected user)
Interrogated group number type (~ subscriber (group) number, 1)
Interrogated group type identifier (~ IGTI = 0 = SNA)
Interrogated group SNA (~ the SNA form a subscriber number)
Result for interrogation (~ accepted)
Number of letters in mnemonic group name (~ 5)
1st Letter of mnemonic (~ N)
2nd Letter of mnemonic (~ o)
3rd Letter of mnemonic (~ l)
4th Letter of mnemonic (~ k)
5th Letter of mnemonic (~ a)
Class of Usage (~ 4)

Table A.7: An example of the contents in a SS-DGNA INTERROGATE4-ACK FACILITY, when the interrogation is rejected for a group number

SS-Type (~ SS-DGNA)
Action Type (~ Interrogation)
Interrogation type (~ Group parameters for affected user)
Interrogated group number type (~ subscriber (group) number, 1)
Interrogated group type identifier (~ IGTI = 1 = SSI)
Interrogated group SNA (~ the SSI form a subscriber number)
Result for interrogation (~ user not authorized)

History

Document history			
September 1996	Public Enquiry	PE 114:	1996-09-23 to 1997-01-17