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3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"

OAM&P for cdma2000 (3GPP Delta Specification)

Revision: 0

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1 **SCOPE**

2 This document is intended to define the OAM&P Stage 2 and 3 requirements
3 and interface definitions for cdma2000-based systems.

4 **REFERENCES**

- 5 ?{01} 3GPP2 S.R0017-0 3G Wireless Network Management System High
6 Level Requirements; Revision: 0
- 7 ?{02} 3GPP TS 32.101: "3G Telecom Management: Principles and high
8 level requirements"; V3.4.0 (Release 99)
9 ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32101-340.zip
10
- 11 ?{03} 3GPP TS 32.102: "3G Telecom Management architecture"; V3.2.0
12 (Release 99) ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32102-320.zip
13
- 14 ?{04} 3GPP TS 32.104: "3G Performance Management (PM)"; V3.5.0
15 (Release 99) ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32104-350.zip
16
- 17 ?{05} 3GPP TS 32.106-1: "Configuration Management; Part 1: 3G
18 Configuration Management: Concept and
19 Requirements "; V3.1.0 (Release 99)
20 ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-1-310.zip
21
- 22 ?{06} 3GPP TS 32.106-2: "Configuration Management; Part 2:
23 Notification Integration Reference Point:
24 Information Service Version 1"; V3.3.0 (Release
25 99) ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-2-330.zip
26

- 1 ?{07} 3GPP TS 32.106-3: “Configuration Management; Part 3:
2 Notification Integration Reference Point:
3 CORBA Solution Set Version 1:1”; V3.3.0
4 (Release 99) [ftp://ftp.3gpp.org//Specs/2001-
5 12/R1999/32_series/32106-3-330.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-3-330.zip)
- 6 ?{08} 3GPP TS 32.106-4: “Configuration Management; Part 4:
7 Notification Integration Reference Point: CMIP
8 Solution Set Version 1:1”; V3.2.0 (Release 99)
9 [ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-4-
10 320.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-4-320.zip)
- 11 ?{09} 3GPP TS 32.106-5: “Basic Configuration Management IRP:
12 Information Model Version 1”; V3.2.0 (Release
13 99) [ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-
14 5-320.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-5-320.zip)
- 15 ?{10} 3GPP TS 32.106-6: “Basic Configuration Management IRP: CORBA
16 Solution Set Version 1:1”; V3.3.0 (Release 99)
17 [ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-6-
18 330.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-6-330.zip)
- 19 ?{11} 3GPP TS 32.106-7: “Basic Configuration Management IRP: CMIP
20 Solution Set”; V3.3.0 (Release 99)
21 [ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-4-
22 320.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-4-320.zip)
- 23 ?{12} 3GPP TS 32.106-8: “Configuration Management; Part 8: Name
24 Convention for Managed Objects”; V3.2.0
25 (Release 99) [ftp://ftp.3gpp.org//Specs/2001-
26 12/R1999/32_series/32106-8-320.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32106-8-320.zip)
- 27 ?{13} 3GPP TS 32.111-1: “Fault Management; Part 1: 3G Fault
28 Management Requirements”; V3.2.0 (Release
29 99) [ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32111-
30 1-320.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32111-1-320.zip)
- 31 ?{14} 3GPP TS 32.111-2: “Fault Management; Part 2: Alarm Integration
32 Reference Point: Information Service Version
33 1”; V3.3.0 (Release 99) [ftp://ftp.3gpp.org//Specs/2001-
34 12/R1999/32_series/32111-2-330.zip](ftp://ftp.3gpp.org//Specs/2001-12/R1999/32_series/32111-2-330.zip)

1 ~~2.2~~ Definitions for the management interface between element
2 management function and network management system.

3

4 For the IS-2000 Revision 0 version of this document 3GPP Charging and Billing
5 requirements and related definitions are not applicable.

6 **Overview of OAM&P for cdma2000 (3GPP Delta Specification)**

7 The structure of this document is aligned with the structure of the 3GPP 32-
8 series of specifications (excluding the Billing and Charging related definitions
9 specified in 32.105 as well as 32.005 and 32.015):

10 ~~2.2~~ 32.101 "3G Telecom Management: Principles and high level
11 requirements" (see [2]) contains complementary and extended
12 requirements to [1] as well as the definition of the logical
13 management architecture.

14 ~~2.2~~ 32.102 "3G Telecom Management architecture" (see [3]) defines a
15 framework to help define a telecom management physical
16 architecture and to adopt standards and provide products that are
17 easy to integrate.

18 ~~2.2~~ 32.104 "3G Performance Management (PM)" (see [4]) contains
19 general requirements on performance management as well as
20 definitions for the transfer of measurement files.

21 ~~2.2~~ The 32.106-series (see [5]-[12]) contains configuration management
22 requirements as well as related definitions for the management
23 interface between element management function and network
24 management system (Basic CM IRP, Notification IRP).

25 ~~2.2~~ The 32.111-series (see [13]-[16]) contains fault management
26 requirements as well as related definitions for the management
27 interface between element management function and network
28 management system (Alarm IRP).

29 ~~2.2~~ Annex A "Terminology" provides a mapping between UMTS and
30 cdma2000 terminology for clarification purpose.

1 **32.101 "3G Telecom Management: Principles and high level requirements"**

2 (see [02])

3 **General Exceptions**

4 The term UMTS is not applicable for the cdma2000 family of standards.
5 Nevertheless the term UMTS is used in 3GPP 32.101 [02] mostly in the broader
6 sense of "3G Wireless System". If not stated otherwise there are no additions or
7 exclusions required.

8 **Specific Exceptions**

9 Chapter 01: Scope

10 There are no additions or exclusions.

11 Chapter 02: References

12 Normative Reference on TS 22.101 is not applicable for cdma2000
13 systems.

14 Chapter 03: Definitions and abbreviations

15 There are no additions or exclusions.

16 Chapter 04: General

17 The UMTS reference model introduced in chapter 4.1.2 ("UMTS Reference
18 Model") is not applicable for cdma2000 systems (including the listed
19 signalling mechanisms). The IS-2000 Network Reference Model and
20 network interfaces will apply (see [50]).

21 Reference on TS 22.101 in chapter 4.1.3 ("UMTS Provisioning Entities") is
22 not applicable for cdma2000 systems.

1 Chapter 05: Architectural Framework

2 With respect to chapter 5.5 (“Interface Definition”) the following
 3 clarifications shall apply:

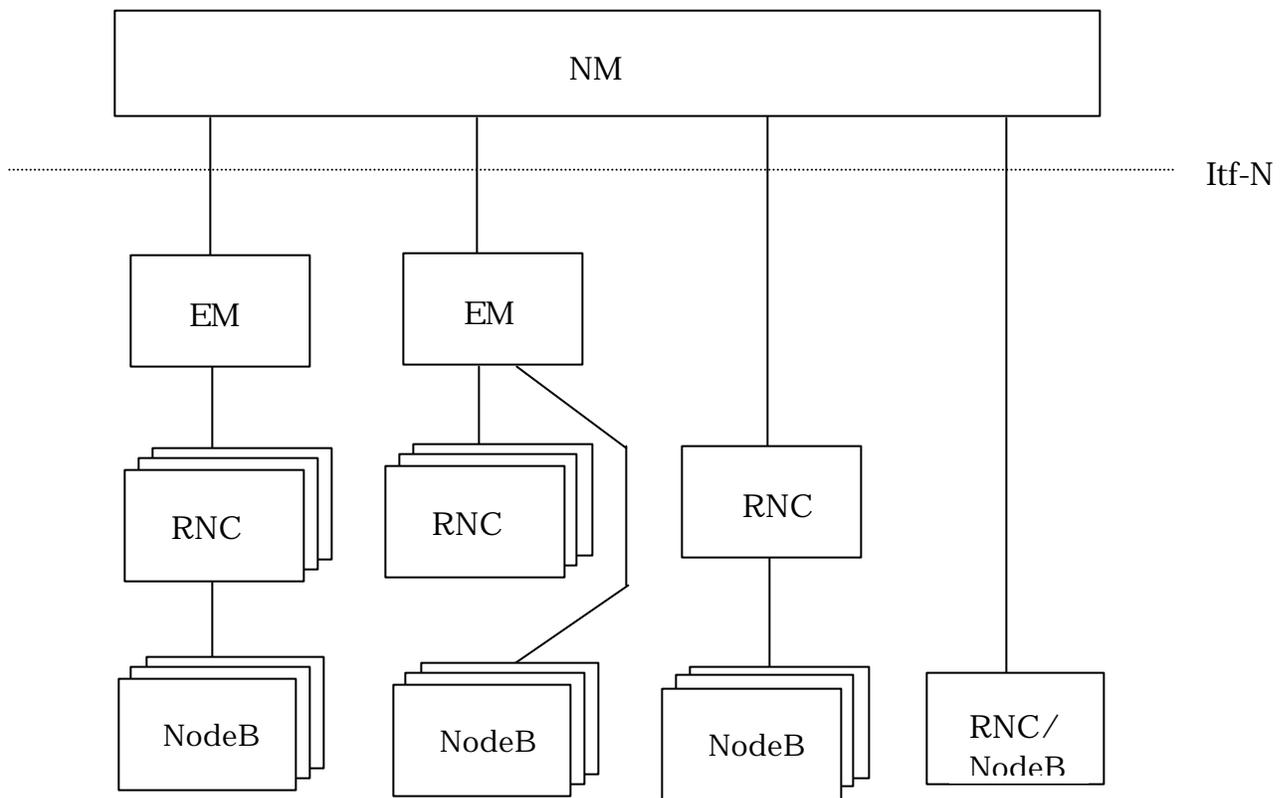
4 ~~2~~ Itf-N is the “Northbound” interface between the Network
 5 Management System and the Element Manager/Network Element.

6 ~~2~~ RNC is equivalent to BSC in cdma2000 systems and shall be
 7 interpreted as such.

8 ~~2~~ NodeB is equivalent to BTS in cdma2000 systems and shall be
 9 interpreted as such.

10 ~~2~~ SubLink is equivalent to Abis in cdma2000 systems and shall be
 11 interpreted as such.

12 Typical network configurations supported by the NRM



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Chapter 06: UMTS Management Processes

There are no additions or exclusions.

Chapter 07: Process Decompositions

There are no additions or exclusions.

Chapter 08: UMTS Management Functional Architecture

Chapter 8.9 (“Accounting Management”) is not applicable for the IS-2000 Release 0 version of this document (see also related statement in section “General” of this document).

Chapter 09: Methodology

There are no additions or exclusions.

Annex A (normative): UMTS Management Application Layer Protocols

There are no additions or exclusions.

Annex B (normative): UMTS Management Network Layer Protocols

There are no additions or exclusions.

Annex C (normative): UMTS Management IRP Solution Sets

There are no additions or exclusions.

Annex D (informative): Change history

There are no additions or exclusions.

1 **32.102 "3G Telecom Management architecture"**

2 (see [03])

3 **General Exceptions**

4 The term UMTS is not applicable for the cdma2000 family of standards.
5 Nevertheless the term UMTS is used in 3GPP 32.102 [03] mostly in the broader
6 sense of "3G Wireless System". If not stated otherwise there are no additions or
7 exclusions required.

8 **Specific Exceptions**

9 Chapter 01: Scope

10 There are no additions or exclusions.

11 Chapter 02: References

12 There are no additions or exclusions.

13 Chapter 03: Definitions, symbols and abbreviations

14 There are no additions or exclusions.

15 Chapter 04: General

16 The UMTS reference model introduced in chapter 4.1.2 ("UMTS Reference
17 Model") is not applicable for cdma2000 systems (including the listed
18 signalling mechanisms). The IS-2000 Network Reference Model and
19 network interfaces will apply (see [50]).

20 Reference on TS22.101 in chapter 4.1.3 ("UMTS Provisioning Entities") is
21 not applicable for cdma2000 systems.

22 Chapter 05: General view of UMTS Management Physical architectures

23 There are no additions or exclusions.

1 Chapter 06: Basic objectives for a UMTS Physical Architecture

2 There are no additions or exclusions.

3 Chapter 07: TM Architectural aspects

4 The OSF instantiations presented within Figure 2 of chapter 7.3.1
5 (“Interfaces”) are not applicable for cdma2000. The IS-2000 Network
6 Reference Model and related interworking with 2G systems might apply
7 (see [50]).

8 The Element Management Domains and Interfaces presented (see Figure
9 3) and described within chapter 7.3.1 (“Interfaces”) are not applicable for
10 cdma2000 systems. The IS-2000 Network Reference Model and network
11 interfaces will apply (see [50]).

12 Chapter 08: UMTS Management Physical architectures

13 Interface definitions made in Chapter 8.3 (“Network & Subnetwork
14 Element Management Architecture”) on resource management functions
15 between RNC and NodeB are not applicable for cmda2000 systems. For
16 clarification please note:

17 ~~R~~~~N~~C is equivalent to BSC in cdma2000 systems and shall be
18 interpreted as such.

19 ~~N~~~~B~~ is equivalent to BTS in cdma2000 systems and shall be
20 interpreted as such.

21 Chapter 09: TMN applications

22 There are no additions or exclusions.

23 Chapter 10: Integration Reference Points

24 There are no additions or exclusions.

25 Chapter 11: Implementation aspects

26 There are no additions or exclusions.

27 Chapter 12: TMN planning and design considerations

28 There are no additions or exclusions.

1 Chapter 13: Mediation/Integration

2 There are no additions or exclusions.

3 Annex A (informative): Technology considerations

4 There are no additions or exclusions.

5 Annex B (informative): Change history

6 There are no additions or exclusions.

7

1 **32.104 “Performance Management (PM)”**

2 (see [04])

3 **General Exceptions**

4 There are no global additions or exclusions for 3GPP 32.104 [04].

5 **Specific Exceptions**

6 Chapter 01: Scope

7 There are no additions or exclusions.

8 Chapter 02: References

9 Normative Reference on TS 25.442 is not applicable for cdma2000
10 systems.

11 Normative Reference on GSM 12.04 is not applicable for cdma2000
12 systems (Note: reference to this specification is made in the informative
13 annex D for clarification pupose only).

14 Normative Reference on 3GPP TR 32.800 is not applicable for cdma2000
15 systems.

16 Chapter 03: Definitions and Abbreviations

17 There are no additions or exclusions.

18 Chapter 04: Performance Measurement (PM) concept

19 There are no additions or exclusions.

20 Chapter 05: Performance management requirements

21 Reference on TS 25.442 and TR 32.800 in chapter 5.1.1 (“Basic
22 Functions”) is not applicable for cdma2000 systems. In addition the
23 following clarifications shall apply to definitions made in chapter 5.1.1:

1 ~~2~~Itf-N is the “Northbound” interface between the Network
2 Management System and the Element Manager/Network Element.

3 ~~2~~RNC is equivalent to BSC in cdma2000 systems and shall be
4 interpreted as such.

5 ~~2~~NodeB is equivalent to BTS in cdma2000 systems and shall be
6 interpreted as such.

7 ~~2~~SubLink is equivalent to Abis in cdma2000 systems and shall be
8 interpreted as such.

9 Annex A (normative): Measurement Report File Format

10 There are no additions or exclusions.

11 Annex B (normative): Measurement Report File Conventions and Transfer Procedure

12 Reference on TS 25.442 in chapter B.1.1 (“NE based approach”) is not
13 applicable for cdma2000 systems. In addition the following clarifications
14 shall apply to definitions made in chapter 5.1.1:

15 ~~2~~RNC is equivalent to BSC in cdma2000 systems and shall be
16 interpreted as such.

17 ~~2~~NodeB is equivalent to BTS in cdma2000 systems and shall be
18 interpreted as such.

19 ~~2~~SubLink is equivalent to Abis in cdma2000 systems and shall be
20 interpreted as such.

21 Annex C (normative): Performance Measurement (PM) requirements summary

22 References to GSM specifications are for clarification purpose only.
23 Chapter C2-C10 are not applicable for cdma2000 systems in the form as
24 they are specified in the current version of [4]. As soon as 3GPP will
25 define the specific measurements for 3G wireless systems 3GPP2 will
26 evaluate the outcome for maximum re-use. The definition of cdma2000
27 specific measurements is for further study.

28 Annex D (informative): _____ The table oriented file format structure

29 Reference to GSM 12.04 is made for clarification purpose only.

1 Annex E (informative):-----Change history

2 There are no additions or exclusions.

3

1 **32.106-series "Configuration Management"**

2 (see [05]-[12])

3 **General Exceptions**

4 There are no global additions or exclusions for 3GPP 32.106-1 [05], 3GPP
5 32.106-2 [06], 3GPP 32.106-3 [07], 3GPP 32.106-4 [08], 32.106-5 [09], 32.106-
6 6 [10], 32.106-7 [11] and 32.106-8 [12].

7 **Specific Exceptions**

8 **32.106-1 "Configuration Management; Part 1: 3G Configuration Management:**
9 **Concept and Requirements"**

10 (see [05])

11 Chapter 01: Scope

12 There are no additions or exclusions.

13 Chapter 02: References

14 There are no additions or exclusions.

15 Chapter 03: Definitions and abbreviations

16 There are no additions or exclusions.

17 Chapter 04: Network configuration management (CM)

18 There are no additions or exclusions.

19 Chapter 05: CM service components

20 There are no additions or exclusions.

21 Chapter 06: CM functions

22 There are no additions or exclusions.

1 Chapter 07: Itf-N Interface

2 There are no additions or exclusions.

3 Annex A (informative): Change history

4 There are no additions or exclusions.

5 **32.106-2 "Configuration Management; Part 2: Notification Integration Reference**
6 **Point: Information Service Version 1"**

7 (see [06])

8 Chapter 01: Scope

9 There are no additions or exclusions.

10 Chapter 02: References

11 There are no additions or exclusions.

12 Chapter 03: Definitions and abbreviations

13 There are no additions or exclusions.

14 Chapter 04: System Overview

15 There are no additions or exclusions.

16 Chapter 05: Modelling Approach

17 There are no additions or exclusions.

18 Chapter 06: IRP Information Service

19 There are no additions or exclusions.

20 Annex A (informative): Change history

21 There are no additions or exclusions.

22 **32.106-3 "Configuration Management; Part 3: Notification Integration Reference**
23 **Point: CORBA Solution Set Version 1:1"**

24 (see [07])

1 Chapter 01: Scope

2 There are no additions or exclusions.

3 Chapter 02: References

4 There are no additions or exclusions.

5 Chapter 03: Definitions and abbreviations

6 There are no additions or exclusions.

7 Chapter 04: Architectural Features

8 There are no additions or exclusions.

9 Chapter 05: Mapping

10 There are no additions or exclusions.

11 Chapter 06: Use of OMG Notification StructuredEvent

12 There are no additions or exclusions.

13 Chapter 07: IRPAgent's Behaviour

14 There are no additions or exclusions.

15 Chapter 08: Example

16 There are no additions or exclusions.

17 Annex A (normative): Notification IRP CORBA IDL

18 There are no additions or exclusions.

19 Annex B (informative): Change history

20 There are no additions or exclusions.

21 **32.106-4 "Configuration Management; Part 4: Notification Integration Reference**
22 **Point: CMIP Solution Set Version 1:1"**

23 (see [08])

24 Chapter 01: Scope

25 There are no additions or exclusions.

1 Chapter 02: References

2 There are no additions or exclusions.

3 Chapter 03: Definitions and abbreviations

4 There are no additions or exclusions.

5 Chapter 04: Basic aspects

6 There are no additions or exclusions.

7 Chapter 05: GDMO definitions

8 There are no additions or exclusions.

9 Chapter 06: ASN.1 definitions

10 There are no additions or exclusions.

11 Annex A (informative): Change history

12 There are no additions or exclusions.

13 **32.106-5 "Basic Configuration Management IRP: Information Model Version 1"**

14 (see [09])

15 Chapter 01: Scope

16 There are no additions or exclusions.

17 Chapter 02: References

18 Reference to 3GPP TS 32.002 is not applicable for cdma2000 systems
19 (the IS-2000 Network Reference Model and network interfaces will apply
20 (see [50]). In addition reference to GSM 12.20 is informative only.

21 Chapter 03: Definitions and abbreviations

22 There are no additions or exclusions.

23 Chapter 04: System Overview

24 There are no additions or exclusions.

1 Chapter 05: Modelling Approach

2 There are no additions or exclusions.

3 Chapter 06: IRP Information Model

4 Chapter 6.4 “UMTS Network Resource Model (NRM)” defines the object
5 model to be used by the Basic Configuration IRP. In its current state this
6 resource model contains some UMTS specific definitions if compared to
7 relevant cdma2000 requirements and architecture recommendations –
8 subsequently the following clarifications and restrictions shall apply:

9 ~~✎~~ The RncFunction, NodeBFunction, IubLink, UtranCell and
10 AucFunction managed object classes are not used in cdma2000.

11 ~~✎~~ MSC, VLR, HLR and EIR are equivalent to definitions within the
12 cdma2000 Network Reference Model [50].

13 ~~✎~~ SGSN, GGSN, BG, SMS-GMSC and SMS-IW-MSC have no direct
14 equivalent within the cdma2000 Network Reference Model [50] and
15 are therefore not applicable.

16 ~~✎~~ For modelling purposes all cdma2000 network elements currently
17 not included in the resource model may be derived from Managed
18 Object Class (MOC) *3GManagedElement* and *ManagedFunction* (as
19 defined in chapter 6.3 “Generic Network Resource Model (NRM)”.

20 In addition, the following 3GPP2 additions apply:

21 ~~✎~~ The containment and naming for cdma2000 NRM managed objects
22 (i.e., the BscFunction, AcFunction, Abis, BtsFunction, AaaFunction
23 and PdsnFunction managed objects) are shown in Annex C.1.

24 ~~✎~~ The cdma2000 NRM managed objects are defined in Annex C.2.

25 ~~✎~~ The cdma2000 NRM managed object associations are defined in
26 Annex C.3.

27 Subsequent detailed delta definitions are specified in Annex C.

28 Annex A (informative): Supported UMTS network configurations.

29 There are no additions or exclusions.

1 Annex B (normative): Event Types and Extended Event Types

2 There are no additions or exclusions.

3 Annex C (informative): Change history

4 There are no additions or exclusions.

5 **32.106-6 "Basic Configuration Management IRP: CORBA Solution Set Version 1:1"**

6 (see [10])

7 Chapter 01: Scope

8 There are no additions or exclusions.

9 Chapter 02: References

10 There are no additions or exclusions.

11 Chapter 03: Definitions and abbreviations

12 There are no additions or exclusions.

13 Chapter 04: IRP solution set version

14 There are no additions or exclusions.

15 Chapter 05: Architectural Features

16 There are no additions or exclusions.

17 Chapter 06: Mapping

18 Chapter 6.5 "Network Resource Model (NRM) Mapping" [10] maps the
19 Information Model managed object classes to the CORBA Solution Set
20 classes. With respect to Network Resource Model related definitions
21 (chapter 6.5 "Network Resource Model Mapping") please refer to
22 clarifications and restrictions specified on 32.106-5 "Basic Configuration
23 Management IRP: Information Model Version 1" chapter 6 "IRP
24 Information Model".

25 In addition, the following 3GPP2 additions apply:

26 ✎ The BscFunction managed object class is defined in Annex D.1.1.

- 1 ~~✂~~The BtsFunction managed object class is defined in Annex D.1.2.
- 2 ~~✂~~The Abis managed object class is defined in Annex D.1.3.
- 3 ~~✂~~The AcFunction managed object class is defined in Annex D.1.4.
- 4 ~~✂~~The AaaFunction managed object class is defined in Annex D.1.5.
- 5 ~~✂~~The PdsnFunction managed object class is defined in Annex D.1.6.
- 6 ~~✂~~The 3GPP2 CORBA IDL NRM definitions are defined in Annex D.2.
- 7 Subsequent detailed delta definitions are specified in Annex D.

8 Chapter 07: Use of OMG StructuredEvent

9 There are no additions or exclusions.

10 Chapter 08: Rules for management information model extensions

11 There are no additions or exclusions.

12 Annex A (normative): CORBA IDL, Access Protocol

13 There are no additions or exclusions.

14 Annex B (normative): CORBA IDL, Notification Definitions

15 There are no additions or exclusions.

16 Annex C (normative): CORBA IDL, NRM Definitions

17 Annex C “CORBA IDL, NRM Definitions” of 32.106-6 [10] defines the
18 CORBA IDL for the 3GPP NRM managed objects. This IDL will still apply
19 to 3GPP2. CORBA IDL for the cdma2000 NRM managed objects is
20 defined in Annex D.2 “3GPP2 CORBA IDL NRM Definitions” within this
21 document.

22 Annex D (informative): Change history

23 There are no additions or exclusions.

24 **32.106-7 "Basic Configuration Management IRP: CMIP Solution Set"**

25 (see [11])

1 Chapter 01: Scope

2 There are no additions or exclusions.

3 Chapter 02: References

4 There are no additions or exclusions.

5 Chapter 03: Definitions and abbreviations

6 There are no additions or exclusions.

7 Chapter 04: Basic aspects

8 Chapter 4.2.5 “Mapping Of MOCs” [11] maps the Information Model
9 managed object classes to the CMIP Solution Set managed objects. With
10 respect to Network Resource Model related definitions (chapter 4.2.5 and
11 4.2.6) please refer to clarifications and restrictions specified on 32.106-5
12 “Basic Configuration Management IRP: Information Model Version 1”
13 chapter 6 “IRP Information Model”. In addition, the additions defined in
14 Annex E.1.1 apply.

15 Chapter 4.2.6 “Mapping Of Attributes” maps the Information Model
16 managed object class attributes to the CMIP Solution Set managed object
17 attributes. With respect to Network Resource Model related definitions
18 (chapter 4.2.5 and 4.2.6) please refer to clarifications and restrictions
19 specified on 32.106-5 “Basic Configuration Management IRP: Information
20 Model Version 1” chapter 6 “IRP Information Model”. In addition, the
21 additions defined in Annex E.1.2 apply.

22 Subsequent detailed delta definitions are specified in Annex E.

23 Chapter 05: GDMO definitions

24 Chapter 5 “GDMO Definitions” defines the CMIP GDMO and ASN.1 for
25 the 3GPP NRM managed objects. This GDMO and ASN.1 will still apply to
26 3GPP2. GDMO for the cdma2000 NRM managed objects is defined in
27 Annex E.2 “3GPP2 GDMO Definitions” within this document.

28 The GDMO object identifiers to be used within this 3GPP2 delta
29 specification still need to be determined.

1 Chapter 06: ASN.1 definitions

2 The ManagedElementType enumeration has hard coded managed
3 element types. For the cdma2000 NRM, the mappings defined in Annex
4 E.1.3 need to be used. In addition note that 3GPP2 ASN.1 definitions are
5 not required.

6 Annex A (informative): Change history

7 There are no additions or exclusions.

8 **32.106-8 "Configuration Management; Part 8: Name Convention for Managed**
9 **Objects"**

10 (see [12])

11 Chapter 01: Scope

12 There are no additions or exclusions.

13 Chapter 02: References

14 There are no additions or exclusions.

15 Chapter 03: Definitions and abbreviations

16 There are no additions or exclusions.

17 Chapter 04: System Overview

18 There are no additions or exclusions.

19 Chapter 05: Name Convention for Managed Objects

20 There are no additions or exclusions.

21 Chapter 06: Representations of DN

22 There are no additions or exclusions.

23 Chapter 07: String Representation of DN

24 There are no additions or exclusions.

25 Chapter 08: Examples of DN in string representation

26 There are no additions or exclusions.

1 Chapter 09: Usage Scenario

2 There are no additions or exclusions.

3 Annex A (normative): Mapping of RDN AttributeType to Strings

4 There are no additions or exclusions.

5 Annex B (normative): Rule for MO Designers regarding AttributeType interpretation

6 There are no additions or exclusions.

7 Annex C (informative): DN Prefix and Local Distinguished Name (LDN)

8 There are no additions or exclusions.

9 Annex D (informative): Change history

10 There are no additions or exclusions.

11

1 **32.111-series “Fault Management”**

2 (see [13]-[16])

3 **General Exceptions**

4 There are no global additions or exclusions for 3GPP 32.111-1 [13], 3GPP
5 32.111-2 [14], 3GPP 32.111-3 [15] and 3GPP 32.111-4 [16].

6 **Specific Exceptions**

7 **32.111-1 "Fault Management; Part 1: 3G Fault Management Requirements"**

8 (see [13])

9 Chapter 01: Scope

10 There are no additions or exclusions.

11 Chapter 02: References

12 There are no additions or exclusions.

13 Chapter 03: Definitions and abbreviations

14 There are no additions or exclusions.

15 Chapter 04: Fault Management concept and requirements

16 There are no additions or exclusions.

17 Chapter 05: N interface (Irf-N)

18 There are no additions or exclusions.

19 Annex A (informative): Change history

20 There are no additions or exclusions.

1 **32.111-2 "Fault Management; Part 2: Alarm Integration Reference Point:**
2 **Information Service Version 1"**

3 (see [14])

4 Chapter 01: Scope

5 There are no additions or exclusions.

6 Chapter 02: References

7 There are no additions or exclusions.

8 Chapter 03: Definitions and abbreviations

9 There are no additions or exclusions.

10 Chapter 04: Basic aspects

11 There are no additions or exclusions.

12 Chapter 05: IRP Information Service

13 There are no additions or exclusions.

14 Chapter 06: Dynamic Model

15 There are no additions or exclusions.

16 Annex A (normative): Event Types and Extended Event Types

17 There are no additions or exclusions.

18 Annex B (normative): Probable Causes

19 The following Probable Causes from Table B.3 "Probable Causes from
20 GSM 12.11" are not applicable to cdma2000:

21

GSM 12.11 Probable Cause	Event Type
A-bis to TRX interface failure	Equipment
Invalid MSU received	Communications
LAPD link protocol failure	Communications

1
 2 Definition of cdma2000-specific probable cause values is for further
 3 study.

4 Annex C (informative): Examples of using notifyChangedAlarm

5 There are no additions or exclusions.

6 Annex D (normative): Mapping of Alarm Information Reference to its Solution Set Equivalents

7 There are no additions or exclusions.

8 Annex E (informative): Change history

9 There are no additions or exclusions.

10 **32.111-3 "Fault Management; Part 3: Alarm Integration Reference Point: CORBA**
 11 **Solution Set Version 1:1"**

12 (see [15])

13 Chapter 01: Scope

14 There are no additions or exclusions.

15 Chapter 02: References

16 There are no additions or exclusions.

17 Chapter 03: Definitions and abbreviations

18 There are no additions or exclusions.

19 Chapter 04: Architectural Features

20 There are no additions or exclusions.

1 Chapter 05: Mapping

2 There are no additions or exclusions.

3 Chapter 06: Use of OMG Structured Event

4 There are no additions or exclusions.

5 Chapter 07: AlarmIRPNotifications Interface

6 There are no additions or exclusions.

7 Annex A (normative): IDL specification

8 Regarding the use of Probable Cause please refer to exceptions stated on
9 32.111-2 "Alarm Integration Reference Point: Information Service",
10 Appendix B "Probable Causes".

11 Annex B (informative): Change history

12 There are no additions or exclusions.

13 **32.111-4 "Fault Management; Part 4: Alarm Integration Reference Point: CMIP**
14 **Solution Set Version 1:1"**

15 (see [16])

16 Chapter 01: Scope

17 There are no additions or exclusions.

18 Chapter 02: References

19 There are no additions or exclusions.

20 Chapter 03: Definitions and abbreviations

21 There are no additions or exclusions.

22 Chapter 04: Basic aspects

23 There are no additions or exclusions.

24 Chapter 05: GDMO definitions

25 There are no additions or exclusions.

- 1 Chapter 06: ASN.1 definitions for Alarm IRP
- 2 There are no additions or exclusions.
- 3 Annex A (informative): Change history
- 4 There are no additions or exclusions.

1 **Annex A (informative) “Terminology”**

2 This Annex provides a mapping between UMTS and cdma2000 terminology for
 3 clarification purpose.

4

UMTS	cdma2000
Radio Network Controller (RNC)	Base Station Controller (BSC)
Node B	Base Transceiver System (BTS)
Iub (Interface between RNC and Node B)	A _{bis} (Interface between BSC and BTS)
Itf-N (“Northbound” Interface)	Reference Point O (see [50])
Authentication Centre (AuC)	Authentication Center (AC)
Equipment Identity Register (EIR)	Equipment Identity Register (EIR)
Home Location Register (HLR)	Home Location Register (HLR)
Mobile-services Switching Centre (MSC) / Gateway MSC (GMSC)	Mobile Switching Center (MSC)
SMS Gateway MSC (SMS-GMSC) / SMS Interworking MSC	Similar in functionality to Message Center (MC)
Visitor Location Register (VLR)	Visitor Location Register (VLR)

5

1 Annex B (informative) “Integration Reference Points - IRPs”

2 This Annex is providing an IRP overview for information purpose (see also [3]).

3 IRP DEFINITIONS

4 ~~✎~~ **IRP Agent:** The IRP Agent encapsulates a well-defined subset of
5 network (element) functions. It interacts with IRP Managers using
6 an IRP. From the IRP Manager’s perspective, the IRP Agent
7 behaviour is only visible via the IRP.

8 ~~✎~~ **IRP Manager:** The IRP Manager models a user of the IRP Agent and
9 it interacts directly with the IRP Agent using the IRP. Since the
10 IRP Manager represents an IRP Agent user, they help delimit the
11 IRP Agent and give a clear picture of what the IRP Agent is supposed
12 to do. From the IRP Agent perspective, the IRP Manager behaviour is
13 only visible via the IRP.

14 ~~✎~~ **IRP Information Model:** An IRP Information Model consists of an
15 IRP Information Service and a Network Resource Model (see below
16 for definitions of IRP Information Service and Network Resource
17 Model).

18 ~~✎~~ **IRP Information Service:** An IRP Information Service describes the
19 information flow and support objects for a certain functional area,
20 e.g. the alarm information service in the fault management area. As
21 an example of support objects, for the Alarm IRP there is the "alarm
22 information" and "alarm list".

23 ~~✎~~ **IRP Solution Set:** An IRP Solution Set is a mapping of the IRP
24 Information Service to one of several technologies (CORBA/IDL,
25 SNMP/SMI, CMIP/GDMO etc.). An IRP Information Service can be
26 mapped to several different IRP Solution Sets. Different technology
27 selections may be done for different IRPs.

1 ✎ **Network Resource Model (NRM):** A protocol independent model
2 describing managed objects representing network resources, e.g.
3 an RNC or NodeB.

4 GENERAL

5 Relating to the OSI functional areas "FCAPS", IRPs are here introduced
6 addressing parts of "FCAPS" – Fault, Configuration, Performance, and Security
7 management. Comparing with TMF TOM (Telecom Operations Map) [20], the
8 introduced IRPs address process interfaces at the EML-NML (Element
9 Management Layer – Network Management Layer) boundary. In 3GPP/SA5
10 context, this can also be applied to the Itf-N between EM-NM and NE-NM.
11 The three cornerstones of the IRP concept are:

12 ✎ **Top-down, process-driven modelling approach**

13 The purpose of each IRP is automation of one specific task, related
14 to TMF TOM. This allows taking a "one step at a time" approach
15 with a focus on the most important tasks.

16 ✎ **Protocol-independent modelling**

17 Each IRP consists of a protocol-independent model (the IRP
18 information model) and several protocol-dependent models (IRP
19 solution sets).

20 ✎ **Standard based protocol dependent modelling**

21 Models in different IRP solution sets (CMIP, SNMP, WBEM etc.) will
22 be different as existing standard models of the corresponding
23 protocol environment need to be considered. The means that
24 solution sets largely need to be "hand crafted".

25 INTEGRATION LEVELS

26 Virtually all types of telecom/datacom networks comprise many different
27 technologies purchased from several different vendors. This implies that the
28 corresponding management solution need to be built by integrating product-
29 specific applications from different vendors with a number of generic
30 applications that each provide some aspect of multi-vendor and/or multi-
31 technology support. A complete management solution is thus composed of
32 several independent applications.

1 The following levels of integration are defined:

2 ~~2.2~~**Screen Integration:** Each application provides its own specific
3 graphical user interface (GUI) that need to be accessible from a
4 single, unified screen (a common desktop). A seamless integration
5 between the various GUIs is then required. Screen Integration will
6 not be standardised in the present document.

7 ~~2.3~~**Application Integration:** Applications need to interwork, on a
8 machine-machine basis, in order to automate various end-to-end
9 processes of a communication provider.

10 APPLICATION INTEGRATION

11 Interfaces related to application integration can be divided in the following
12 three categories:

13 ~~2.1~~**High-level generic interfaces** between generic applications on the
14 network and service management layers. The same approach and
15 concepts apply for these as the next category:

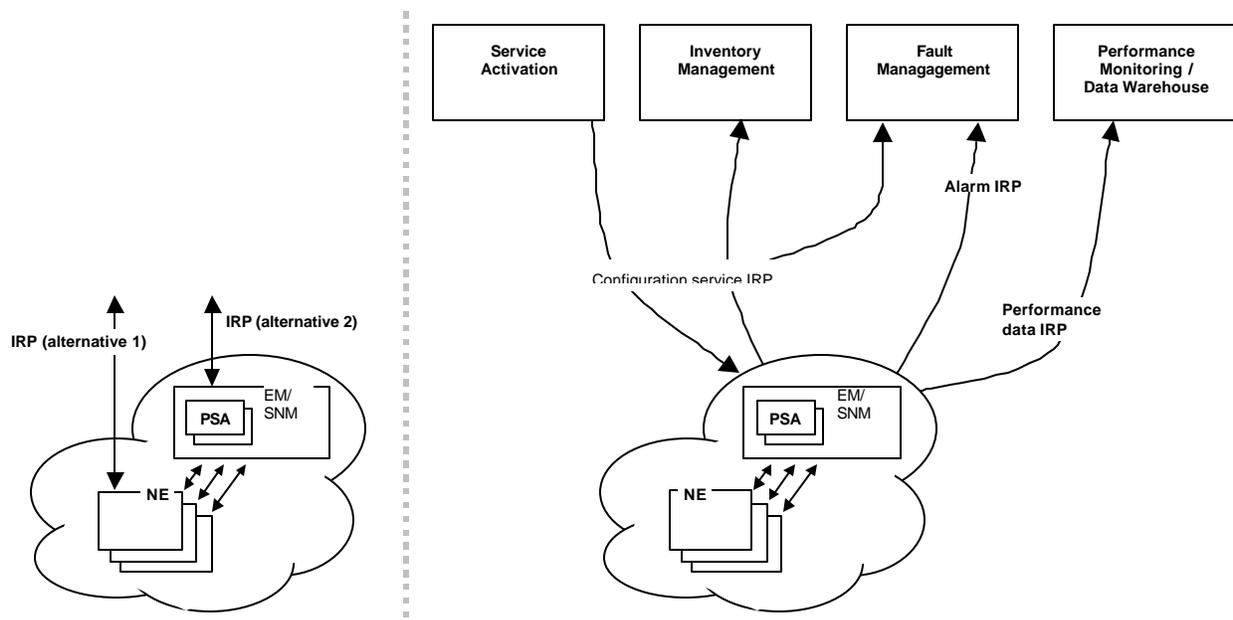
16 ~~2.2~~**High-level (technology-independent to the extent possible)**
17 **interfaces** between product-specific and generic applications are
18 needed in order to automate and streamline frequently occurring
19 tasks applicable to several types of network elements. A top-down
20 approach shall be taken when defining these interfaces, where the
21 main input is (1) business processes of a communication provider,
22 and (2) the types of generic applications that are used to
23 implement the process support. The interfaces need to be stable,
24 open and (preferably) standardised. These IRPs are discussed below
25 under the heading Network Infrastructure IRPs.

26 ~~2.3~~**Detailed (product-specific) interfaces** between product-specific
27 applications and the corresponding network elements are of course
28 also needed. These interfaces are defined using the traditional
29 bottom-up approach, where the actual network infrastructure is
30 modelled. This is the traditional TMN approach to element
31 management. The management information in these interfaces is
32 not further discussed in this document, as it is internal to a

1 specific development organisation and does not need to be open. In
2 fact, by publishing the management information in these
3 interfaces, too much of the internal design may be revealed and it
4 may become impossible to later enhance the systems that are
5 using the interfaces. The management services (operations and
6 notifications) and protocol shall however be open and standardised
7 as long as they are independent of the NRM describing the
8 managed NEs/NRs.

9 NETWORK INFRASTRUCTURE IRPS

10 When providing integrated management solutions for multi-vendor networks,
11 there is a strong requirement that the NEs and the management solutions that
12 go together with them are systems integrateable. It is here proposed that the
13 telecom vendors provide a set of Network Infrastructure IRPs.
14 It should be noted that these IRPs could be provided by either the NE, or the
15 Element Manager (EM) or Sub-Network Manager (SNM) that goes together with
16 the type of NE. There is actually not a clear distinction any more between NE
17 and element management applications, mainly due to the increased processing
18 capacity of the equipment platforms. Embedded Element Managers providing a
19 web user interface is a common example of that.
20 These IRPs are introduced to ensure interoperability between Product-Specific
21 Applications (PSA) and the types of generic applications shown in the figure
22 below. These IRPs are considered to cover the most basic needs of task
23 automation.



1
2
3 **Figure IRP,1: IRPs for application integration**

4 The following gives examples of some basic IRPs:

5 ~~✎~~ The most basic need of a fault management (FM) application is to
6 support alarm surveillance. Product-specific applications need to
7 supply an *Alarm IRP* to forward alarms from all kinds of NEs and
8 equipment to the FM application.

9 ~~✎~~ A *Basic Configuration Management IRP* is needed for management
10 of topology and logical resources in the network (retrieval of the
11 configuration and status of the network elements). It can also be
12 used by inventory management applications, to track individual
13 pieces of equipment and related data, as well as for all types of
14 Configuration Management e.g. Service Activation applications, as a
15 provisioning interface for frequent configuration activities that
16 require automation. This IRP defines an IRP Information Model,
17 covering both an IRP Information Service and a Network Resource
18 Model.

19 ~~✎~~ Performance Monitoring (PM) information is made available
through the *Performance Data IRP*.

1 It is realised that the Alarm IRP, Performance Data IRP and Basic
2 Configuration Management IRP all have similar needs to use
3 notifications. The corresponding service is formalised as a
4 *Notification IRP*. It specifies: firstly, an interface through which
5 subscriptions to different types of notifications can be set up (or
6 cancelled), and secondly, common attributes for all notifications.

7 Further, applying a common *Name Convention for Managed Objects*
8 is useful for co-operating applications that require identical
9 interpretation of names assigned to network resources under
10 management.

11 DEFINING THE IRPS

12 It is important to avoid dependency on one specific technology, as the
13 technologies will change over time. Applications need to be future-proof; One
14 fundamental principle for achieving this is to clearly separate information
15 models from protocols for the external interfaces, where the information models
16 are more important than the selection of protocols.

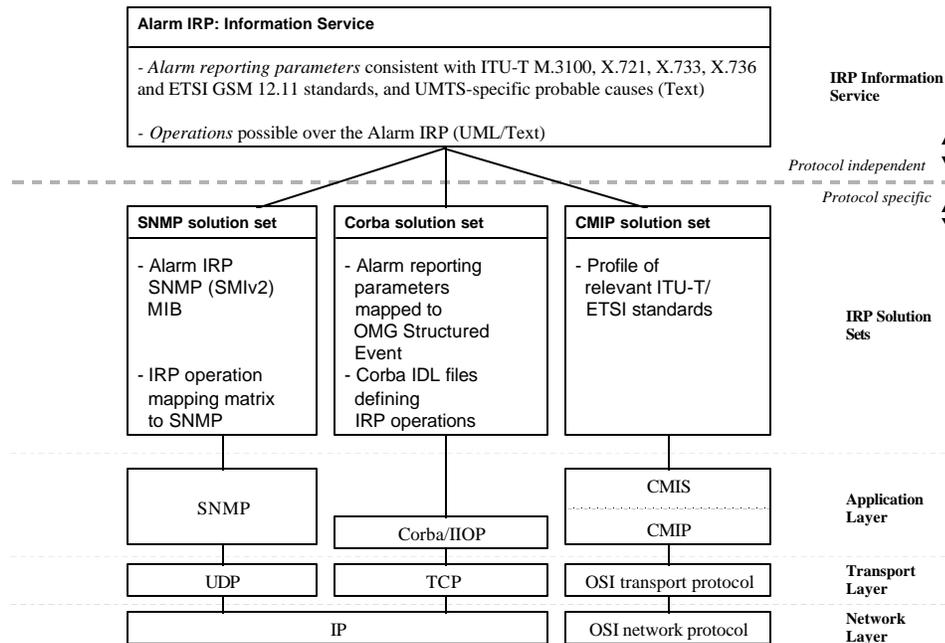
17 Thus, the detailed IRP specifications are divided into two main parts, following
18 the directives from TMF's SMART TMN:

19 *Information models* specified with an implementation neutral
20 modelling language. The Unified Modelling language (UML) has
21 been selected, as it is standardised (by OMG), supported by most
22 object-oriented tools and used in several ongoing standardisation
23 efforts (CIM etc.).

24 *Solution sets*, i.e. mappings of the information models to one or
25 several protocols (CORBA/IDL, SNMP/SMI, CMIP/GDMO,
26 COM/IDL etc.). Different protocol selections may be done for
27 different IRPs.

28 Figure IRP.2 shows an example of how an IRP can be structured (the Alarm
29 IRP).

1



2

Figure IRP.2: IRP example

3 MANDATORY, OPTIONAL AND CONDITIONAL QUALIFIERS

4 This subclause defines a number of terms used to qualify the relationship
 5 between the 'Information Service', the 'Solution Sets' and their impact on the
 6 IRP implementations. The qualifiers defined in this section are used to qualify
 7 IRPAgent behaviour only. This is considered sufficient for the specification of
 8 the IRPs.

9 Table IRP.1 defines the meaning of the three terms Mandatory, Conditional and
 10 Optional when they are used to qualify the relations between operations,
 11 notifications and parameters specified in 'Information Service' documents and
 12 their equivalents in Solution Set (SS) documents.

1
2

Table IRP.1: Definitions of Mandatory, Optional and Conditional Used in Information Service Documents

	Mandatory (M)	Conditional (C)	Optional (O)
Operation and Notification	Each Operation and Notification shall be mapped to its equivalents in all SS's. Mapped equivalent shall be M.	Each Operation and Notification shall be mapped to its equivalents in at least one SS. Mapped equivalent can be M or O.	Each Operation and Notification shall be mapped to its equivalents in all SS's. Mapped equivalent shall be O.
Input and output parameter	Each parameter shall be mapped to one or more information elements of all SS's. Mapped information elements shall be M.	Each parameter shall be mapped to its equivalent in at least one SS. Mapped equivalent can be M or O.	Each parameter shall be mapped to its equivalent in all SS's. Mapped equivalent shall be O.

3
4
5
6
7

Table IRP.2 defines the meaning of the two terms Mandatory and Optional when they are used to qualify the relations between operations, notifications and parameters equivalents specified in Solutions Sets and their impact on IRPAgent implementation. The terms are used in Solution Set documents.

1 **Table IRP.2: Definitions of Mandatory and Optional Used in Solution Set Documents**

	Mandatory	Optional
Mapped notify equivalent	IRPAgent shall generate it. IRPManager should be prepared to receive and process it.	IRPAgent may generate it. IRPManager should be prepared to receive it but can ignore it.
Mapped operation equivalent	IRPAgent shall have an implementation. IRPManager may use (e.g., invoke) it.	IRPAgent may have an implementation. IRPManager may use (e.g., invoke) it and should be prepared that IRPAgent may not have an implementation.
input parameter of the mapped operation equivalent	IRPAgent shall accept and behave according to its value. IRPManager should use it with a legal value.	If the optional parameter is present the IRPAgent may reject the invocation or the IRPAgent may accept the invocation but ignore the parameter. IRPManager may use it but should be prepared that IRPAgent may reject or ignore it.
Input parameter of mapped notify equivalent AND output parameter of mapped operation equivalent	IRPAgent shall generate it with a legal value. IRPManager should be prepared to receive it but can ignore it.	IRPAgent may generate it. If IRPAgent generates it, it shall use a legal value. IRPManager should be prepared to receive it but can ignore it.

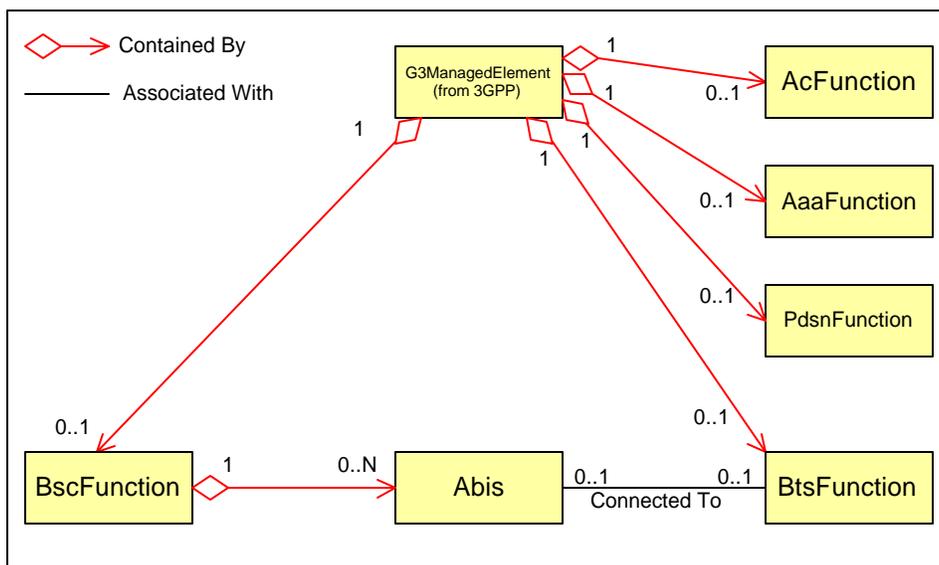
2

1 **Annex C (normative) “32.106-5 Detailed Exceptions and Additions”**

2 C.1 Containment / Naming And Association Diagrams

3 Figure C-1 shows the containment/naming hierarchy and the
 4 associations of the cdma2000 NRM.

5 **Figure C-1: cdma2000 NRM Containment/Naming and Association Diagram**



6
 7
 8 Refer to 32.106-5 [09] for the containment, naming and association
 9 diagrams for the 3GPP managed object classes.

10 C.2 cdma2000-specific Managed Object Class (MOC) Definitions

11 C.2.1 MOC BSCFUNCTION

12 This Managed Object Class represents BSC functionality. For more
 13 information about the BSC, see [50]. It inherits from ManagedFunction.

14 **Table C-1: Attributes of BscFunction**

Name	Qualifier	Description
------	-----------	-------------

Name	Qualifier	Description
bscFunctionId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.

1

2

Table C-2: Notifications of BscFunction

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

3

4

C.2.2 MOC BtsFunction

5

This Managed Object Class represents BTS functionality. For more information about the BTS, see [50]. It inherits from ManagedFunction.

6

7

Table C-3: Attributes of BtsFunction

Name	Qualifier	Description
btsFunctionId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.
btsFunction-Abis	READ-ONLY, M	The value of this attribute shall be the DN of the related Abis instance. This is a reference attribute modeling the role (of the association ConnectedTo) that this BtsFunction is connected to 0-1 Abis

8

1

Table C-4: Notifications of BtsFunction

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

2

3 C.2.3 MOC ABIS

4 The Abis managed object is the logical link to a BTS as seen from the
5 BSC. For more information about the Abis, see [50]. It inherits from
6 ManagedFunction.

7

Table C-5: Attributes of Abis

Name	Qualifier	Description
abisId	READ- ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ- ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.
abis-BtsFunction	READ- ONLY, M	The value of this attribute shall be the DN of the related BtsFunction instance. This is a reference attribute modeling the role (of the association ConnectedTo) that this Abis is connected to 0-1 BtsFunction.

8

9

Table C-6: Notifications of Abis

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	

Name	Qualifier	Notes
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

1

2 C.2.4 MOC AcFUNCTION

3 This Managed Object Class represents AC functionality. For more
 4 information about the AC, see [50]. It inherits from ManagedFunction.

5 **Table C-7: Attributes of AcFunction**

Name	Qualifier	Description
acFunctionId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.

6

7 **Table C-8: Notifications of AcFunction**

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

8

9 C.2.5 MOC AAFUNCTION

10 This Managed Object Class represents AAA functionality. For more
 11 information about the AAA, see [50]. It inherits from ManagedFunction.

1

Table C-9: Attributes of AcFunction

Name	Qualifier	Description
aaaFunctionId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.

2

3

Table C-10: Notifications of AcFunction

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

4

5

C.2.6 MOC PDSNFUNCTION

6

This Managed Object Class represents PDSN functionality. For more information about the PDSN, see [50]. It inherits from ManagedFunction.

8

9

Table C-11: Attributes of AcFunction

Name	Qualifier	Description
pdsnFunctionId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-ONLY, M	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.

10

1

Table C-12: Notifications of AcFunction

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [14])	
notifyObjectCreation	O	
notifyObjectDeletion	O	

2

3 C.3 Associations4 C.3.1 ASSOCIATION CONNECTEDTO (M)

5 This bi-directional association models the relationship between the Abis
6 and BTS (through the BtsFunction). It has two roles, named Abis-
7 BtsFunction and BtsFunction-Abis. These two roles model each
8 MOC's association with the other MOC. Each role is in the MOC
9 definition mapped to a reference attribute with the same name.

1 **Annex D (normative) “32.106-6 Detailed Exceptions and Additions”**

2 *D.1 cdma2000 NRM Managed Object Class (MOC) Mapping*

3 *D.1.1 MOC BSCFUNCTION*

4 **Table D-1: Mapping from NRM MOC BscFunction attributes to SS equivalent MOC**
 5 **BscFunction attributes**

NRM Attributes of MOC BscFunction	SS Attributes	SS Type	QUALIFIER
bscFunctionId	bscFunctionId	string	Read-Only, M
userLabel	userLabel	string	Read-Only, M

6

7 *D.1.2 MOC BTSFUNCTION*

8 **Table D-2: Mapping from NRM MOC BtsFunction attributes and associations to SS**
 9 **equivalent MOC BtsFunction attributes**

NRM Associations/Attributes of MOC BTSFunction	SS Attributes	SS Type	Qualifier
btsFunctionId	btsFunctionId	string	Read-Only, M
UserLabel	userLabel	string	Read-Only, M
ConnectedTo/ BtsFunction-Abis	btsFunctionAbis	BasicCmIRPSsystem::AttributeTypes::MOReference [10]	Read-Only, M

10

11 *D.1.3 MOC ABIS*

12 **Table D-3: Mapping from NRM MOC Abis attributes and associations to SS equivalent**
 13 **MOC Abis attributes**

NRM Associations/Attributes of MOC Abis	SS Attributes	SS Type	Qualifier
AbisId	abisId	string	Read-Only, M
UserLabel	userLabel	string	Read-Only, M

NRM Associations/Attributes of MOC Abis	SS Attributes	SS Type	Qualifier
ConnectedTo/ abis-btsFunction	AbisBtsFunction	BasicCmIRPSystem::AttributeTypes::MOReference [10]	Read-Only, M

1

2 D.1.4 MOC AcFUNCTION

3 **Table D-4: Mapping from NRM MOC AcFunction attributes to SS equivalent MOC**
 4 **AcFunction attributes**

NRM Attributes of MOC AcFunction	SS Attributes	SS Type	Qualifier
acFunctionId	acFunctionId	string	Read-Only, M
UserLabel	userLabel	string	Read-Only, M

5

6 D.1.5 MOC AAAFUNCTION

7 **Table D-5: Mapping from NRM MOC AaaFunction attributes to SS equivalent MOC**
 8 **AaaFunction attributes**

NRM Attributes of MOC AcFunction	SS Attributes	SS Type	Qualifier
aaaFunctionId	aaaFunctionId	string	Read-Only, M
UserLabel	userLabel	string	Read-Only, M

9

10 D.1.6 MOC PDSNFUNCTION

11 **Table D-6: Mapping from NRM MOC PdsnFunction attributes to SS equivalent MOC**
 12 **PdsnFunction attributes**

NRM Attributes of MOC AcFunction	SS Attributes	SS Type	Qualifier
pdsnFunctionId	pdsnFunctionId	string	Read-Only, M
userLabel	userLabel	string	Read-Only, M

13

D.2 3GPP2 CORBA IDL NRM Definitions

```
1
2
3     #ifndef BasicCmCDMANRMDefs_idl
4     #define BasicCmCDMANRMDefs_idl
5
6     #pragma prefix "3gpp2.org"
7
8     /**
9     This module defines constants for each MO class name and the attribute names for
10    each defined MO class.
11    */
12    module BasicCmCDMANRMDefs
13    {
14        /**
15        Definitions for MO class BscFunction
16        */
17        interface BscFunction
18        {
19            const string CLASS = "BscFunction";
20
21            // Attribute Names
22            //
23            const string bscFunctionId = "bscFunctionId";
24            const string userLabel = "userLabel";
25        };
26
27        /**
28        Definitions for MO class BtsFunction
29        */
30        interface BtsFunction
31        {
32            const string CLASS = "BtsFunction";
33
34            // Attribute Names
35            //
36            const string btsFunctionId = "btsFunctionId";
37            const string userLabel = "userLabel";
38            const string btsFunctionAbis = "btsFunctionAbis";
39        };
40
41        /**
42        Definitions for MO class Abis
43        */
44        interface Abis
45        {
46            const string CLASS = "Abis";
47
48            // Attribute Names
49            //
```

```
1      const string abisId = "abisId";
2      const string userLabel = "userLabel";
3      const string abisBtsFunction = "abisBtsFunction";
4  };
5
6  /**
7   Definitions for MO class AcFunction
8   */
9  interface AcFunction
10 {
11     const string CLASS = "AcFunction";
12
13     // Attribute Names
14     //
15     const string acFunctionId = "acFunctionId";
16     const string userLabel = "userLabel";
17 };
18
19 /**
20 Definitions for MO class AaaFunction
21 */
22 interface AaaFunction
23 {
24     const string CLASS = "AaaFunction";
25
26     // Attribute Names
27     //
28     const string aaaFunctionId = "aaaFunctionId";
29     const string userLabel = "userLabel";
30 };
31
32 /**
33 Definitions for MO class PdsnFunction
34 */
35 interface PdsnFunction
36 {
37     const string CLASS = "PdsnFunction";
38
39     // Attribute Names
40     //
41     const string pdsnFunctionId = "pdsnFunctionId";
42     const string userLabel = "userLabel";
43 };
44 };
45
46 #endif
```

1 **Annex E (normative) “32.106-7 Detailed Exceptions and Additions”**

2 *E.1 cdma2000 NRM Mapping*

3 *E.1.1 MAPPING OF MOCs*

4 Table E-1 maps the MOCs defined in the cdma2000 Network Resource
5 Model onto the equivalent MOCs of the CMIP Solution Set.

6 **Table E-1: Mapping of MOCs**

Original MOCs	CMIP MOCs
AaaFunction	aaaFunction
Abis	Abis
AcFunction	acFunction
BscFunction	bscFunction
BtsFunction	btsFunction
PdsnFunction	pdsnFunction

7

8 *E.1.2 MAPPING OF ATTRIBUTES*

9 Table E-2 maps the cdma2000 Information Model managed object class
10 attributes to the CMIP Solution Set managed object attributes.

11 **Table E-2: Mapping of Attributes**

Original Attribute	CMIP Attribute
aaaFunctionId	aaaFunctionId
abis-BtsFunction	abisBtsFunctionLink
abisId	abisId
acFunctionId	acFunctionId
bscFunctionId	bscFunctionId
btsFunction-Abis	btsAbisLink
btsFunctionId	btsFunctionId
pdsnFunctionId	pdsnFunctionId
userLabel	userLabel

12

1 E.1.3 MAPPING OF ENUMERATIONS

2 **Table E-3: ManagedElementType Enumeration Mapping For cdma2000**
 3 **Managed Elements**

CMIP MOC	ManagedElementType Value
aaaFunction	bG
acFunction	aUC
bscFunction	rnc
btsFunction	NodeB
pdsnFunction	gmsc

4

5 E.2 3GPP2 GDMO Definitions

6 E.2.1 MANAGED OBJECT CLASSES (MOCs)

7 **aaaFunction** MANAGED OBJECT CLASS

8 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;

9 CHARACTERIZED BY

10 aaaFunctionBasicPackage PACKAGE

11 BEHAVIOUR

12 aaaFunctionBasicPackageBehaviour BEHAVIOUR

13 DEFINED AS

14 "An instance of MOC represents the logical function of an AAA";

15 ATTRIBUTES

16 aaaFunctionId GET;;;

17 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 1};

18

19 **abis** MANAGED OBJECT CLASS

20 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;

21 CHARACTERIZED BY

22 abisBasicPackage,

23 abisAssociationPackage;

```
1 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 2};
2
3 acFunction MANAGED OBJECT CLASS
4 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;
5 CHARACTERIZED BY
6 acFunctionBasicPackage PACKAGE
7 BEHAVIOUR
8 acFunctionBasicPackageBehaviour BEHAVIOUR
9 DEFINED AS
10 "An instance of MOC represents the logical function of an AC";;
11 ATTRIBUTES
12 acFunctionId GET;;;
13 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 3};
14
15 bscFunction MANAGED OBJECT CLASS
16 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;
17 CHARACTERIZED BY
18 bscFunctionBasicPackage;
19 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 4};
20
21 btsFunction MANAGED OBJECT CLASS
22 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;
23 CHARACTERIZED BY
24 btsFunctionBasicPackage,
25 btsFunctionAssociationPackage;
26 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 4};
27
28 pdsnFunction MANAGED OBJECT CLASS
29 DERIVED FROM "3GPP TS 32.106-7" : managedFunction;
30 CHARACTERIZED BY
31 pdsnFunctionBasicPackage PACKAGE
32 BEHAVIOUR
33 pdsnFunctionBasicPackageBehaviour BEHAVIOUR
34 DEFINED AS
35 "An instance of MOC represents the logical function of an PDSN";;
36 ATTRIBUTES
37 pdsnFunctionId GET;;;
38 REGISTERED AS {toBeDetermined(28) managedObjectClass(3) 5};
```

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E.2.2 PACKAGES

3

abisAssociationPackage PACKAGE

4

BEHAVIOUR

5

abisAssociationPackageBehaviour;

6

ATTRIBUTES

7

abisBtsFunctionLink GET,

8

REGISTERED AS {toBeDetermined(28) Package(4) 1};

9

10

abisBasicPackage PACKAGE

11

BEHAVIOUR

12

abisBasicPackageBehaviour;

13

ATTRIBUTES

14

abisId GET;

15

REGISTERED AS {toBeDetermined(28) Package(4) 2};

16

17

bscFunctionBasicPackage PACKAGE

18

BEHAVIOUR

19

bscFunctionBasicPackageBehaviour;

20

ATTRIBUTES

21

bscFunctionId GET;

22

REGISTERED AS {toBeDetermined(28) Package(4) 3};

23

24

btsFunctionAssociationPackage PACKAGE

25

BEHAVIOUR

26

btsFunctionAssociationPackageBehaviour;

27

ATTRIBUTES

28

btsAbisLink GET;

29

REGISTERED AS {toBeDetermined(28) Package(4) 4};

30

31

btsFunctionBasicPackage PACKAGE

32

BEHAVIOUR

33

btsFunctionBasicPackageBehaviour;

34

ATTRIBUTES

35

btsFunctionId GET;

36

REGISTERED AS {toBeDetermined(28) Package(4) 5};

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E.2.3 ATTRIBUTES

aaaFunctionId ATTRIBUTE

WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
aaaFunctionIdBehaviour;
REGISTERED AS {toBeDetermined(28) Attribute(7) 1};

abisBtsFunctionLink ATTRIBUTE

WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectPointer;
MATCHES FOR EQUALITY;
BEHAVIOUR
abisBtsFunctionLinkBehaviour;
REGISTERED AS {toBeDetermined(28) Attribute(7) 2};

abisId ATTRIBUTE

WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
abisIdBehaviour;
REGISTERED AS {toBeDetermined(28) Attribute(7) 3};

acFunctionId ATTRIBUTE

WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
acFunctionIdBehaviour;
REGISTERED AS {toBeDetermined(28) Attribute(7) 4};

bscFunctionId ATTRIBUTE

WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
bscFunctionIdBehaviour;
REGISTERED AS {toBeDetermined(28) Attribute(7) 5};

1
2 **btsAbisLink** ATTRIBUTE
3 WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectPointer;
4 MATCHES FOR EQUALITY;
5 BEHAVIOUR
6 btsAbisLinkBehaviour;
7 REGISTERED AS {toBeDetermined(28) Attribute(7) 6};

8
9 **btsFunctionId** ATTRIBUTE
10 WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
11 MATCHES FOR EQUALITY;
12 BEHAVIOUR
13 btsFunctionIdBehaviour;
14 REGISTERED AS {toBeDetermined(28) Attribute(7) 7};

15
16 **pdsnFunctionId** ATTRIBUTE
17 WITH ATTRIBUTE SYNTAX TS32-106-7TypeModule .GeneralObjectId;
18 MATCHES FOR EQUALITY;
19 BEHAVIOUR
20 pdsnFunctionIdBehaviour;
21 REGISTERED AS {toBeDetermined(28) Attribute(7) 8};

22

23 *E.2.4 NAME BINDINGS*

24 **aaaFunction-g3ManagedElement** NAME BINDING
25 SUBORDINATE OBJECT CLASS aaaFunction;
26 NAMED BY SUPERIOR OBJECT CLASS "3GPP TS 32.106-7" : g3ManagedElement;
27 WITH ATTRIBUTE aaaFunctionId;
28 BEHAVIOUR
29 aaaFunction-g3ManagedElementBehaviour;
30 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
31 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
32 REGISTERED AS {toBeDetermined(28) NameBinding(6) 1};

33

34 **abis-bscFunction** NAME BINDING
35 SUBORDINATE OBJECT CLASS abis;
36 NAMED BY SUPERIOR OBJECT CLASS bscFunction;

1 WITH ATTRIBUTE abisId;
2 BEHAVIOUR
3 abis-bscFunctionBehaviour;
4 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
5 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
6 REGISTERED AS {toBeDetermined(28) NameBinding(6) 2};
7
8 **acFunction-g3ManagedElement** NAME BINDING
9 SUBORDINATE OBJECT CLASS acFunction;
10 NAMED BY SUPERIOR OBJECT CLASS "3GPP TS 32.106-7" : g3ManagedElement;
11 WITH ATTRIBUTE acFunctionId;
12 BEHAVIOUR
13 acFunction-g3ManagedElementBehaviour;
14 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
15 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
16 REGISTERED AS {toBeDetermined(28) NameBinding(6) 3};
17
18 **bscFunction-g3ManagedElement** NAME BINDING
19 SUBORDINATE OBJECT CLASS bscFunction;
20 NAMED BY SUPERIOR OBJECT CLASS "3GPP TS 32.106-7" : g3ManagedElement;
21 WITH ATTRIBUTE bscFunctionId;
22 BEHAVIOUR
23 bscFunction-g3ManagedElementBehaviour;
24 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
25 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
26 REGISTERED AS {toBeDetermined(28) NameBinding(6) 4};
27
28 **btsFunction-g3ManagedElement** NAME BINDING
29 SUBORDINATE OBJECT CLASS btsFunction;
30 NAMED BY SUPERIOR OBJECT CLASS "3GPP TS 32.106-7" : g3ManagedElement;
31 WITH ATTRIBUTE btsFunctionId;
32 BEHAVIOUR
33 btsFunction-g3ManagedElementBehaviour;
34 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
35 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
36 REGISTERED AS {toBeDetermined(28) NameBinding(6) 5};
37
38 **pdsnFunction-g3ManagedElement** NAME BINDING

1 SUBORDINATE OBJECT CLASS pdsnFunction;
2 NAMED BY SUPERIOR OBJECT CLASS "3GPP TS 32.106-7" : g3ManagedElement;
3 WITH ATTRIBUTE pdsnFunctionId;
4 BEHAVIOUR
5 pdsnFunction-g3ManagedElementBehaviour;
6 CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
7 DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
8 REGISTERED AS {toBeDetermined(28) NameBinding(6) 6};
9

10 E.2.5 BEHAVIOURS

11 **aaaFunction-g3ManagedElementBehaviour** BEHAVIOUR

12 DEFINED AS

13 "The name binding represents a relationship in which a 3gManagedElement contains
14 and controls an aaaFunction. When automatic instance naming is used, the choice
15 of name bindings left as a local matter.";

17 **aaaFunctionIdBehaviour** BEHAVIOUR

18 DEFINED AS

19 "This attribute identifies a aaaFunction instance.";

21 **abis-bscFunctionBehaviour** BEHAVIOUR

22 DEFINED AS

23 "The name binding represents a relationship in which a bscFunction contains and
24 controls a abis. When automatic instance naming is used, the choice of name
25 bindings left as a local matter.";

27 **abisAssociationPackageBehaviour** BEHAVIOUR

28 DEFINED AS

29 "The attribute 'abisBtsFunctionLink' points to the btsFunction instance which this
30 abis instance connects to.";

32 **abisBasicPackageBehaviour** BEHAVIOUR

33 DEFINED AS

34 "This managed object class models the Iub Link between a Bts and a BSC.";

36 **abisBtsFunctionLinkBehaviour** BEHAVIOUR

1 DEFINED AS
2 "This attribute points to the btsFunction instance which this abis instance
3 connects directly to.";
4
5 **abisIdBehaviour** BEHAVIOUR
6 DEFINED AS
7 "This attribute names an instance of the 'abis' object class.";
8
9 **acFunction-g3ManagedElementBehaviour** BEHAVIOUR
10 DEFINED AS
11 "The name binding represents a relationship in which a 3gManagedElement contains
12 and controls an acFunction. When automatic instance naming is used, the choice
13 of name bindings left as a local matter.";
14
15 **acFunctionIdBehaviour** BEHAVIOUR
16 DEFINED AS
17 "This attribute identifies a acFunction instance.";
18
19 **bscFunction-g3ManagedElementBehaviour** BEHAVIOUR
20 DEFINED AS
21 "The name binding represents a relationship in which a 3gManagedElement contains
22 and controls a bscFunction. When automatic instance naming is used, the choice
23 of name bindings left as a local matter.";
24
25 **bscFunctionBasicPackageBehaviour** BEHAVIOUR
26 DEFINED AS
27 "This MOC represents BSC function.";
28
29 **bscFunctionIdBehaviour** BEHAVIOUR
30 DEFINED AS
31 "This attribute names an instance of the 'bscFunction' object class.";
32
33 **btsAbisLinkBehaviour** BEHAVIOUR
34 DEFINED AS
35 "This attribute points to the Abis instance which connectes to the related
36 btsFunction instance directly.";
37
38 **btsFunction-g3ManagedElementBehaviour** BEHAVIOUR

1 DEFINED AS
2 "The name binding represents a relationship in which a 3gManagedElement contains
3 and controls a btsFunction. When automatic instance naming is used, the choice
4 of name bindings left as a local matter.";
5
6 **btsFunctionAssociationPackageBehaviour** BEHAVIOUR
7 DEFINED AS
8 "The attribute 'btsAbisLink' points to the abis instance which connectes
9 to this btsFunction instance directly. It implements the attribute bts-Abis
10 of MOC BtsFunction";
11
12 **btsFunctionBasicPackageBehaviour** BEHAVIOUR
13 DEFINED AS
14 "This managed object class represents the BTS functionality.";
15
16 **btsFunctionIdBehaviour** BEHAVIOUR
17 DEFINED AS
18 "This attribute names an instance of the 'btsFunction' object class.";
19
20 **pdsnFunction-g3ManagedElementBehaviour** BEHAVIOUR
21 DEFINED AS
22 "The name binding represents a relationship in which a 3gManagedElement contains
23 and controls an pdsnFunction. When automatic instance naming is used, the choice
24 of name bindings left as a local matter.";
25
26 **pdsnFunctionIdBehaviour** BEHAVIOUR
27 DEFINED AS
28 "This attribute identifies a pdsnFunction instance.";
29