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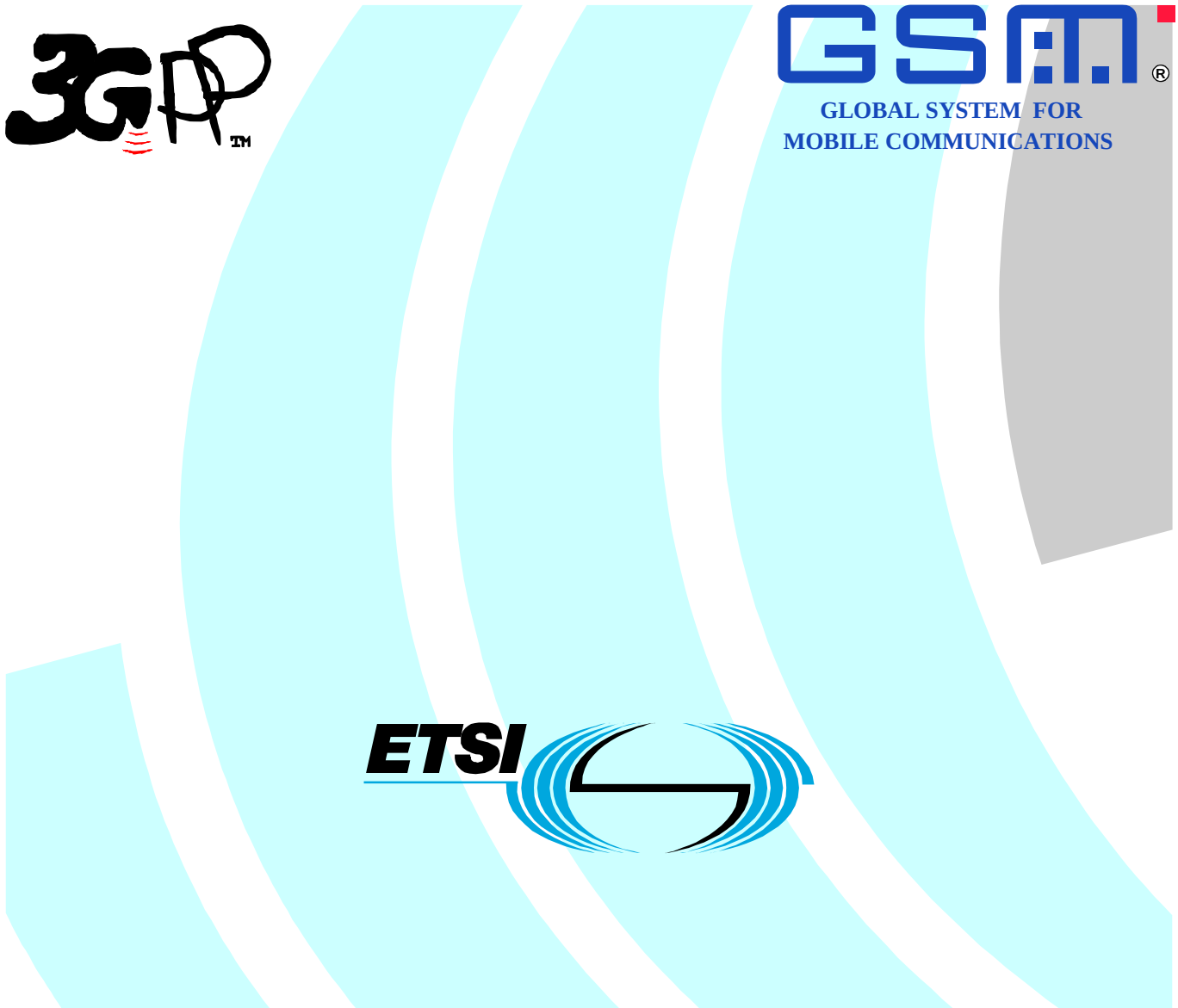
Technical Specification

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Telecommunication management;
Configuration Management (CM);
Kernel CM Integration Reference Point (IRP):
Common Management Information Protocol (CMIP)
Solution Set (SS)
(3GPP TS 32.664 version 6.2.0 Release 6)



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Foreword

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Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Configuration Management (CM), as identified below:

32.661: "Kernel CM; Requirements".

32.662: "Kernel CM; Information service (IS)".

32.663: "Kernel CM Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

32.664: "Kernel CM Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)".

A third generation telecommunication network is composed of a multitude of different network elements (NE). For a successful operation of the network the operator must be provided with mechnisms allowing him to manage the network. These management activities can be grouped into several areas: configuration management, fault management, performance management, and accounting management and security management.

The present document is part of a set of technical specifications defining the telecommunication management (TM) of 3G systems. The TM principles are described in 3GPP TS 32.101 [1]. The TM architecture is described in 3GPP TS 32.102 [2]. The other specifications define the interface (ITf-N) between the managing system (manager), which is in general the network manager (NM) and the managed system (agent), which is either an element manager (EM) or the managed NE itself. The Itf-N is composed of a number of integration reference points (IRPs) defining the information in the agent that is visible for the manager, the operations that the manager may perform on this information and the notifications that are sent from the agent to the manager. One of these IRPs is the Kernel Configuration Management IRP.

Each IRP is specified by four TS, the requirements part, the information service (IS) part, the CORBA solution set (SS) and the CMIP solution set.

1 Scope

The present document specifies the Common Management Information Protocol (CMIP) Solution Set (SS) for the Kernel Configuration Management IRP: Information Service defined in 3GPP TS 32.662 [7]. In detail:

- Clause 4 contains an introduction to some concepts that are the base for some specific aspects of the CMIP interfaces.
- Clause 5 contains the GDMO definitions for the Kernel Configuration Management IRPover the CMIP interfaces
- Clause 6 contains the ASN.1 definitions supporting the GDMO definitions provided in clause 5.

This Solution Set specification is related to 3GPP TS 32.662 V6.3.X.

2 References

The following documents contain provisions that, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.102: "Telecommunication management; Architecture".

[3] 3GPP TS 32.304: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)".

[4] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP) management; Information Service (IS)".

[5] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[6] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic Configuration Management Integration Reference Point (IRP): Information Service (IS)".

[7] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS)".

[8] ITU-T Recommendation X.710: "Information technology - Open Systems Interconnection - Common Management Information Service".

[9] ITU-T Recommendation X.721: "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[10] ITU-T Recommendation M.3100 (1995): "Generic network information model".

[11] ITU-T Recommendation X.730: "Information Technology – Open Systems Interconnection – Systems Management: Object Management Function"

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.600 [5] apply.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASN.1	Abstract Syntax Notation 1
CMIP	Common Management Information Protocol
GDMO	Guidelines for the Definition of Managed Objects
IOC	Information Object Class
IRP	Integration Reference Point
IS	Information Service
ISO	International Standards Organization
ITU-T	International Telecommunication Union, Telecommunication Sector
MOC	Managed Object Class
NE	Network Element
OS	Operations System
SS	Solution Set

4 Basic Aspects

4.1 Architectural Aspects

The architecture of the notifications of the Kernel CM IRP CMIP Solution Set is based on the object management function as defined in ITU-T X.730 [11]. The operations of this IRP are mapped to GDMO actions defined in his document.

4.2 Mapping

The semantics of the Kernel Configuration Management IRP are defined in 3GPP TS 32.662 [7]. The definitions of the management information defined there are independent of any implementation technology and protocol. This clause maps these protocol independent definitions onto their equivalents of the CMIP Solution Set of the Kernel Configuration Management IRP.

4.2.1 Mapping of Information Object Classes

Table 1 maps the IOCs defined in 3GPP TS 32.362 [7] onto the corresponding managed object classes (MOCs) defined in this CMIP Solution Set. The MOCs are qualified either as Mandatory (M) or Optional (O).

Table 1: Mapping of IOCs

IS IOC	CMIP SS MOC	Qualifier
KernelCmIRP	kernelCmIRP	M

4.2.2 Mapping of Operations

Table 2 and table 3 map the operations defined in 3GPP TS 32.362 [7] and 3GPP TS 32.312 [4] onto corresponding GDMO actions. The operations are qualified either as Mandatory (M) or Optional (O).

Table 2: Mapping of operations of the Kernel Configuration Management IRP: IS

IS Interface	IS Operation	GDMO Action or CMISE of CMIP SS	Qualifier
KernelCmOperations	getNRMIRPVersion	getNRMIRPVersion	M

Table 3: Mapping of operations inherited from the Generic IRP Management: IS

IS Interface	IS Operation	GDMO Action or CMISE of CMIP SS	Qualifier
GenericIRPVersionOperations	getIRPVersion	getKernelCmIRPVersion	M
GenericIRPProfileOperations	getOperationProfile	getKernelCmIRPOperationProfile	O
	getNotificationProfile	getKernelCmIRPNotificationProfile	O

4.2.2.1 Mapping of Operation Parameters

The tables in the following subclauses list the parameters of each operation defined in 3GPP TS 32.362 [7] and their equivalents in the CMIP Solution Set.

4.2.2.1.1 Parameter Mapping of the Operation *getNRMIRPVersion*

The IRPManager is able to retrieve NRM SS versions supported by an IRPAgent by using the GDMO action *getNRMIRPVersion*. This action shall be implemented by using the CMISE M-ACTION service [8].

Table 4: Parameter mapping of the operation *getNRMIRPVersion*

IS Parameter	IN/OUT	CMIP SS Equivalent	Qualifier
versionNumberList	OUT	versionNumberList	M
vSEVersionNumberList	OUT	vSEVersionNumberList	M
status	OUT	status	M

4.2.3 Mapping of Notifications

Table 5 maps the notifications defined in 3GPP TS 32.362 [7] onto corresponding GDMO notification defined in ITU-T Recommendation X.721 [9]. The operations are qualified either as Mandatory (M) or Optional (O).

Table 5: Mapping of notifications of the Kernel Configuration Management IRP: IS

Interface	Operation	GDMO Notification or CMISE of CMIP SS	Qualifier
KernelCmNotifications#1	notifyObjectCreation	objectCreation ITU-T X.721 [9] {smi2Notification 6}	O
KernelCmNotifications#2	notifyObjectDeletion	objectDeletion ITU-T X.721 [9] {smi2Notification 7}	O
KernelCmNotifications#3	notifyAttributeValueChange	attributeValueChange ITU-T X.721 [9] {smi2Notification 1}	O
KernelCmNotifications#4	notifyCMSynchronizationRecommended	notifyCMSynchronizationRecommended { ts32-664Notification 1}	O
KernelCmNotifications#5	notifyStateChange	stateChange ITU-T X.721 [9] {smi2Notification 14}	O

4.2.3.1 Mapping of Notification Parameters

Tables 6 to 9 in the following subclauses list the parameters of each notification defined in the Kernel Configuration Management IRP: Information Service [7] and their equivalents in the CMIP solution set.

4.2.3.1.1 Parameter Mapping of the Notification *notifyObjectCreation*

Except for *objectClass*, *objectInstance*, *eventTime* and *notificationType* all parameters defined in the IS are mapped to the M-EVENT-REPORT parameter "Event information". The syntax of this structured parameter is defined for the notification *objectCreation* in ITU-T X.721 [9] by the ASN.1 definition *ObjectInfo*.

Table 6: Parameter mapping of the notification *notifyObjectCreation*

IS Parameter	CMIP SS Equivalent	Qualifier
objectClass	M-EVENT-REPORT Req/Ind parameter "Managed object class"	M
objectInstance	M-EVENT-REPORT Req/Ind parameter "Managed object instance"	M
notificationId	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): notificationIdentifier	M
eventTime	M-EVENT-REPORT Req/Ind parameter "Event time"	M
systemDN	This IS parameter is conditional and not used in the CMIP SS.	-
notificationType	M-EVENT-REPORT Req/Ind parameter "Event type"	M
correlatedNotifications	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): correlatedNotifications	O
sourceIndicator	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): sourceIndicator	O
attributeList	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): attributeList	O
additionalText	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): additionalText	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): additionalInformation	O

4.2.3.1.2 Parameters mapping of the notification *notifyObjectDeletion*

Except for *objectClass*, *objectInstance*, *eventTime* and *notificationType* all parameters defined in the IS are mapped to the M-EVENT-REPORT parameter "Event information". The syntax of this structured parameter is defined for the notification *objectDeletion* in ITU-T X.721 [9] by the ASN.1 definition *ObjectInfo*.

Table 7: Parameter mapping of the notification *notifyObjectDeletion*

IS Parameter	CMIP SS Equivalent	Qualifier
objectClass	M-EVENT-REPORT Req/Ind parameter "Managed Object Class"	M
objectInstance	M-EVENT-REPORT Req/Ind parameter "Managed object instance"	M
notificationId	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): notificationIdentifier	M
eventTime	M-EVENT-REPORT Req/Ind parameter "Event time"	M
systemDN	This IS parameter is conditional and not used in the CMIP SS.	-
notificationType	M-EVENT-REPORT Req/Ind parameter "Event type"	M
correlatedNotifications	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): correlatedNotifications	O
sourceIndicator	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): sourceIndicator	O
attributeList	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): attributeList	O
additionalText	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): additionalText	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (ObjectInfo): additionalInformation	O

4.2.3.1.3 Parameter mapping of the notification *notifyAttributeValueChange*

Except for *objectClass*, *objectInstance*, *eventTime* and *notificationType* all parameters defined in the IS are mapped to the M-EVENT-REPORT parameter "Event information". The syntax of this structured parameter is defined for the notification *attributeValueChange* in ITU-T X.721 [9] by the ASN.1 definition *AttributeValueChangeInfo*.

Table 8: Parameter mapping of the notification *notifyAttributeValueChange*

IS Parameter	CMIP SS Equivalent	Qualifier
objectClass	M-EVENT-REPORT Req/Ind parameter "Managed Object Class"	M
objectInstance	M-EVENT-REPORT Req/Ind parameter "Managed object instance"	M
notificationId	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): notificationIdentifier	M
eventTime	M-EVENT-REPORT Req/Ind parameter "Event time"	M
systemDN	This IS parameter is conditional and not used in the CMIP SS	-
notificationType	M-EVENT-REPORT Req/Ind parameter "Event type"	M
correlatedNotifications	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): correlatedNotifications	O
sourceIndicator	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): sourceIndicator	O
attributeValueChange	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): attributeValueChangeDefinition	M
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): attributeIdentifierList	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): additionalText	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (AttributeValueChangeInfo): additionalInformation	O

4.2.3.1.4 Parameter mapping of the notification *notifyCMSynchronizationRecommended*

Except for *objectClass*, *objectInstance*, *eventTime* and *notificationType* all parameters defined in the IS are mapped to the M-EVENT-REPORT parameter "Event information". The syntax of this structured parameter is defined in the current specification by the ASN.1 definition *notifyCMSynchronizationRecommendedInfo*.

Table 9: Parameter mapping of the notification *notifyCMSynchronizationRecommended*

IS Parameter Name	CMIP SS Equivalent	Qualifier
objectClass	M-EVENT-REPORT Req/Ind parameter "Managed Object Class"	M
objectInstance	M-EVENT-REPORT Req/Ind parameter "Managed object instance"	M
notificationId	M-EVENT-REPORT Req/Ind parameter "Event information" (notifyCMSynchronizationRecommendedInfo): notificationIdentifier	M
eventTime	M-EVENT-REPORT Req/Ind parameter "Event time":	M
systemDN	This IS parameter is conditional and not used in the CMIP SS	-
notificationType	M-EVENT-REPORT Req/Ind parameter: "Event type"	M
baseMOClass	M-EVENT-REPORT Req/Ind parameter "Event information" (notifyCMSynchronizationRecommendedInfo): baseMOClass	M
baseMOInstance	M-EVENT-REPORT Req/Ind parameter "Event information" (notifyCMSynchronizationRecommendedInfo): baseMOInstance	M
scope	M-EVENT-REPORT Req/Ind parameter "Event information" (notifyCMSynchronizationRecommendedInfo): scope	M
additionalText	M-EVENT-REPORT Req/Ind parameter "Event information" (notifyCMSynchronizationRecommendedInfo): additionalText	O

4.2.3.1.5 Parameter mapping of the notification *notifyStateChange*

Except for *objectClass*, *objectInstance*, *eventTime* and *notificationType* all parameters defined in the IS are mapped to the M-EVENT-REPORT parameter "Event information". The syntax of this structured parameter is defined for the notification *stateChange* in ITU-T X.721 [9] by the ASN.1 definition *stateChangeInfo*.

Table 10: Parameter mapping of the notification *notifyStateChange*

IS Parameter	CMIP SS Equivalent	Qualifier
objectClass	M-EVENT-REPORT Req/Ind parameter "Managed Object Class"	M
objectInstance	M-EVENT-REPORT Req/Ind parameter "Managed object instance"	M
notificationId	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): notificationIdentifier	M
eventTime	M-EVENT-REPORT Req/Ind parameter "Event time"	M
systemDN	This IS parameter is conditional and not used in the CMIP SS	-
notificationType	M-EVENT-REPORT Req/Ind parameter "Event type"	M
correlatedNotifications	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): correlatedNotifications	O
sourceIndicator	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): sourceIndicator	O
stateChange	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): stateChangeDefinition	M
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): attributeIdentifierList	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): additionalText	O
no equivalence	M-EVENT-REPORT Req/Ind parameter "Event information" (StateChangeInfo): additionalInformation	O

5 GDMO Definitions

5.1 Managed Object Classes

5.1.1 kernelCmIRP

kernelCmIRP **MANAGED OBJECT CLASS**
DERIVED FROM
"Rec. X.721 | ISO/IEC 10165-2 : 1992":top;
CHARACTERIZED BY
kernelCmIRPIdPackage,
kernelCmIRPVersionPackage,
kernelCmNRMIRPVersionPackage;
CONDITIONAL PACKAGES
kernelCmIRPProfilePackage **PRESENT IF** "an instance supports it",
kernelCmIRPSynchronizationPackage **PRESENT IF** "an instance supports it";
REGISTERED AS { ts32-664ObjectClass 1};

5.2 Packages

5.2.1 kernelCmIRPIdPackage

kernelCmIRPIdPackage **PACKAGE**
BEHAVIOUR
kernelCmIRPIdPackageBehaviour;
ATTRIBUTES
kernelCmIRPId;
REGISTERED AS { ts32-664Package 1};

kernelCmIRPIdPackageBehaviour **BEHAVIOUR**
DEFINED AS
"An instance of the MOC *kernelCmIRP* is identified by the value of the attribute *kernelCmIRPId*.";

5.2.2 kernelCmIRPVersionPackage

kernelCmIRPVersionPackage **PACKAGE**
BEHAVIOUR
kernelCmIRPVersionPackageBehaviour;
ATTRIBUTES
supportedKernelCmIRPVersions GET;
ACTIONS
getKernelCmIRPVersion;
REGISTERED AS { ts32-664Package 2};

kernelCmIRPVersionPackageBehaviour **BEHAVIOUR**
DEFINED AS
"This package has been defined to allow the IRPManager to get information about the Kernel Configuration Management IRP versions supported by the IRPAgent.

The attribute *supportedKernelCmIRPVersions* indicates all versions of the Kernel Configuration Management IRP currently supported by the IRPAgent.

The action *getKernelCmIRPVersion* is invoked by the IRPManager to get information about the Kernel Configuration Management IRP versions supported by the IRPAgent.";

5.2.3 kernelCmNRMIRPVersionPackage

kernelCmNRMIRPVersionPackage **PACKAGE**

BEHAVIOUR
kernelCmNRMIRPVersionPackageBehaviour;
ATTRIBUTES
versionNumberList GET,
vSEVersionNumberList GET;
ACTIONS
getNRMIRPVersion;
REGISTERED AS { ts32-664Package 3};

kernelCmNRMIRPVersionPackageBehaviour **BEHAVIOUR**
DEFINED AS
"This package has been defined to allow the IRPmanager to get detailed information about the NRM SS versions supported by the IRPAgent.

The attribute *versionNumberList* contains a list of supported NRM SS IRP versions.

The attribute *vSEVersionNumberList* contains a list of vendor-specific extended capabilities and features (VSE) that are based on 3GPP published specifications. If an IRPAgent supports VSE, the *vSEVersionNumberList* shall contain identification of one or more documents published by the vendor and additionally the *versionNumberList* shall contain the IRPVersions indicating the 3GPP specifications on which the VSE is based. Otherwise, if an IRPAgent does not support VSE, the *vSEVersionNumberList* shall contain no information. The lists *versionNumberList* and *vSEVersionNumberList* shall not contain duplicates.

The action *kernelCmNRMIRPVersion* is invoked by the IRPManager to get detailed information about the NRM SS versions supported by the IRPAgent.";

5.2.4 kernelCmIRPProfilePackage

kernelCmIRPProfilePackage **PACKAGE**
BEHAVIOUR
kernelCmIRPProfilePackageBehaviour;
ACTIONS
getKernelCmIRPOperationProfile,
getKernelCmIRPNotificationProfile;
REGISTERED AS { ts32-664Package 4};

kernelCmIRPProfilePackageBehaviour **BEHAVIOUR**
DEFINED AS
"This package has been defined to allow the IRPManager to get detailed information about the profile of the Kernel Configuration Management IRP.

The action *getKernelCmIRPOperationProfile* is invoked by the IRPManager to get detailed information about the operations supported by the Kernel Configuration Management IRP.

The action *getKernelCmIRPNotificationProfile* is invoked by the IRPManager to get detailed information about the notifications supported by the Kernel Configuration Management IRP.";

5.2.5 kernelCmIRPSynchronizationPackage

kernelCmIRPSynchronizationPackage **PACKAGE**
BEHAVIOUR
kernelCmIRPSynchronizationPackageBehaviour;
NOTIFICATIONS
notifyCMSynchronizationRecommended;
REGISTERED AS { ts32-664Package 5};

kernelCmRPSynchronizationPackageBehaviour **BEHAVIOUR**
DEFINED AS
"This package has been defined to allow the IRPAgent to notify the subscribed IRPManager that part of or the whole configuration information of the IRPAgent needs to be synchronized.

The notification *notifyCMSynchronizationRecommended* is emitted by the IRPAgent to specify the scope of managed network resources whose information needs to be synchronized.";

5.3 Actions

5.3.1 getKernelCmIRPVersion (M)

getKernelCmIRPVersion **ACTION**
BEHAVIOUR
getKernelCmIRPVersionBehaviour;
MODE
CONFIRMED;
WITH REPLY SYNTAX
TS32-664TypeModule.GetKernelCmIRPVersionReply;
REGISTERED AS { ts32-664Action 1};

getKernelCmIRPVersionBehaviour **BEHAVIOUR**
DEFINED AS
"The IRPManager invokes this action to get information about the Kernel Configuration Management IRP versions supported by the Agent. The 'Action information' field contains no data. The 'Action reply' is composed of the following data:

- *versionNumbersList*
- *status*

The parameter *versionNumbersList* defines a list of Kernel Configuration Management IRP versions supported by the Agent. A list containing no element, i.e. a NULL list, means that the concerned Agent doesn't support any version of the Kernel Configuration Management IRP. The parameter *status* contains the results of the IRPManager action. Possible values: noError (0), error (the value indicates the reason of the error).";

5.3.2 getKernelCmIRPNotificationProfile (O)

getKernelCmIRPNotificationProfile **ACTION**
BEHAVIOUR
getKernelCmIRPNotificationProfileBehaviour;
MODE
CONFIRMED;
WITH INFORMATION SYNTAX
TS32-664TypeModule.IRPVersionNumber;
WITH REPLY SYNTAX
TS32-664TypeModule.GetKernelCmIRPNotificationProfileReply;
REGISTERED AS { ts32-664Action 2};

getKernelCmIRPNotificationProfileBehaviour **BEHAVIOUR**
DEFINED AS
"A IRPManager invokes this action to enquiry about the notification profile (supported notifications and supported parameters) for this specific Kernel Configuration Management IRP version.

The 'Action information' contains the following data:

- *irpVersionNumber*

This mandatory parameter identifies the Kernel Configuration Managemnt IRP version.

The 'Action reply' is composed of the following data:

- *notificationNameProfile*
- *notificationParameterProfile*
- *status*

The parameter *notificationNameProfile* contains a list of notification names, i.e. a NULL list means that the Kernel Configuration Management IRP doesn't support any notification. The parameter *notificationParameterProfile* contains a set of elements, each element corresponds to a notification name and is composed by a set of parameter names. The parameter *status* contains the results of this action. Possible values: noError (0), error (the value indicates the reason of the error).";

5.3.3 getKernelCmIRPOperationProfile (O)

getKernelCmIRPOperationProfile **ACTION**
BEHAVIOUR
getKernelCmIRPOperationProfileBehaviour;

MODE
CONFIRMED;
WITH INFORMATION SYNTAX
TS32-664TypeModule.IRPVersionNumber;
WITH REPLY SYNTAX
TS32-664TypeModule.GetKernelCmIRPOperationProfileReply;
REGISTERED AS { ts32-664Action 3};

getKernelCmIRPOperationProfileBehaviour **BEHAVIOUR**
DEFINED AS
"A IRPManager invokes this action to enquiry about the operation profile (supported operations and supported parameters) for this specific Kernel Configuration Management IRP version.

The 'Action information' contains the following data:

- *irpVersionNumber*

This mandatory parameter identifies the Kernel Configuration Management IRP version.

The 'Action reply' is composed of the following data:

- *operationNameProfile*
- *operationParameterProfile*
- *status*

The parameter *operationNameProfile* contains a list of operation names. The parameter *operationParameterProfile* contains a set of elements, each element corresponds to an operation name and is composed by a set of parameter names. The parameter *status* contains the results of this action. Possible values: noError (0), error (the value indicates the reason of the error).";

5.3.4 getNRMIRPVersion (O)

getNRMIRPVersion **ACTION**
BEHAVIOUR
getNRMIRPVersionBehaviour;
MODE
CONFIRMED;
WITH REPLY SYNTAX
TS32-664TypeModule.GetNRMIRPVersionReply;
REGISTERED AS { ts32-664Action 4};

getNRMIRPVersionBehaviour **BEHAVIOUR**
DEFINED AS
"The IRPManager invokes this action to get information about the NRM SS versions supported by the IRPAgent. The 'Action information' field contains no data. The 'Action reply' is composed of the following data:

- *versionNumbersList*
- *vSEVersionNumberList*
- *status*

The parameter *versionNumbersList* defines a list of NRM SS versions supported by an IRPAgent. If the IRPAgent supports the vendor-specific extended capabilities and features (VSE), the parameter *vSEVersionNumberList* contains idendification of one or more documents published by the vendor. Otherwise if the IRPAgent does not support VSE, the parameter shall not contain any information. The parameter *status* contains the results of the IRPManager action. Possible values: Operation succeded (0), operation failed (1).";

5.4 Attributes

5.4.1 kernelCmIRPId

kernelCmIRPId **ATTRIBUTE**
WITH ATTRIBUTE SYNTAX
TS32-664TypeModule.GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
kernelCmIRPIdBehaviour;
REGISTERED AS { ts32-664Attribute 1};

kernelCmIRPIdBehaviour **BEHAVIOUR**
DEFINED AS
"This attribute names an instance of the MOC *kernelCmIRP*.";

5.4.2 supportedKernelCmIRPVersions

supportedKernelCmIRPVersions **ATTRIBUTE**
WITH ATTRIBUTE SYNTAX
TS32-664TypeModule.SupportedKernelCmIRPVersions;
MATCHES FOR EQUALITY;
BEHAVIOUR
supportedKernelCmIRPVersionsBehaviour;
REGISTERED AS { ts32-664Attribute 2};

supportedKernelCmIRPVersionsBehaviour **BEHAVIOUR**
DEFINED AS
"This attribute provides the information concerning the Kernel Configuration Management IRP versions currently supported by the Agent.";

5.4.3 versionNumberList

versionNumberList **ATTRIBUTE**
WITH ATTRIBUTE SYNTAX
TS32-664TypeModule.VersionNumberList;
MATCHES FOR EQUALITY;
BEHAVIOUR
versionNumberListBehaviour;
REGISTERED AS { ts32-664Attribute 3};

versionNumberListBehaviour **BEHAVIOUR**
DEFINED AS
"This attribute provides the information concerning the NRM SS versions currently supported by an IRPAgent.";

5.4.4 vSEVersionNumberList

vSEVersionNumberList **ATTRIBUTE**
WITH ATTRIBUTE SYNTAX
TS32-664TypeModule.VSEVersionNumberList;
MATCHES FOR EQUALITY;
BEHAVIOUR
vSEVersionNumberListBehaviour;
REGISTERED AS { ts32-664Attribute 4};

vSEVersionNumberListBehaviour **BEHAVIOUR**
DEFINED AS
"This attribute provides the information regarding identification of one or more documents published by the vendor and currently supported by an IRPAgent.";

5.5 Parameters

none

5.6 Notifications

5.6.1 notifyCMSynchronizationRecommended(O)

notifyCMSynchronizationRecommended **NOTIFICATION**
BEHAVIOUR
notifyCMSynchronizationRecommendedBehaviour;
WITH INFORMATION SYNTAX

```
        TS32-664TypeModule.NotifyCMSynchronizationRecommendedInfo;
REGISTERED AS     { ts32-664Notification 1 };

notifyCMSynchronizationRecommendedBehaviour BEHAVIOUR
DEFINED AS
    "This notification type is used to notify IRPManager that part or whole of the CM information needs to be
    synchonized. In this notification, IRPAgent may specify the objects that are to be synchronized. For example, when
    a new managed element which contains a lot of MOIs is added, IRPAgent may just send this notification specifying
    the root object of a subtree in the MIT, and NMC may then trigger an operation to get the requested CM
    information";
```

6 ASN.1 Definitions

```
TS32-664TypeModule {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0) umts-Operation-
Maintenance(3) ts32-664(664) informationModel(0) asn1Module(2) version1(1)}

DEFINITIONS IMPLICIT TAGS ::=
BEGIN

--EXPORTS everything

IMPORTS

-- from ITU-T X.721
AdditionalText, NotificationIdentifier
   FROM Attribute-ASN1Module {joint-iso-ccitt ms(9) smi(3) part2(2) asn1Module (2) 1}

-- from ITU-T X.711
ObjectInstance, ObjectClass, Scope
   FROM CMIP-1 { joint-iso-ccitt ms(9) cmip(1) modules(0) protocol(3) };

-- 3GPP TS 32.664 related Object Identifiers

baseNodeUMTS             OBJECT IDENTIFIER ::= {itu-t (0) identified-organization (4)
                                                etsi (0) mobileDomain (0)
                                                umts-Operation-Maintenance (3)}

ts32-664Prefix           OBJECT IDENTIFIER ::= {baseNodeUMTS ts32-664(664)}
ts32-664InfoModel        OBJECT IDENTIFIER ::= {ts32-664Prefix informationModel(0)}

ts32-664ObjectClass      OBJECT IDENTIFIER ::= {ts32-664InfoModel managedObjectClass(3)}
ts32-664Package          OBJECT IDENTIFIER ::= {ts32-664InfoModel package(4)}
ts32-664Parameter        OBJECT IDENTIFIER ::= {ts32-664InfoModel parameter(5)}
ts32-664Attribute        OBJECT IDENTIFIER ::= {ts32-664InfoModel attribute(7)}
ts32-664Action           OBJECT IDENTIFIER ::= {ts32-664InfoModel action(9)}
ts32-664Notification     OBJECT IDENTIFIER ::= {ts32-664InfoModel notification(10)}

ErrorCauses ::= ENUMERATED
   {
   noError                    (0),   -- operation / notification successfully performed
   unspecifiedErrorReason   (255)    -- operation failed, specific error unknown
   }

GetKernelCmIRPVersionReply ::= SEQUENCE
   {
   versionNumberList      SupportedKernelCmIRPVersions,
   status                 ErrorCauses
   }

GetKernelCmIRPNotificationProfileReply ::= SEQUENCE
   {
   notificationNameProfile           NotificationList,
   notificationParameterProfile      ParameterListOfList,
   status                            ErrorCauses
   }

GetKernelCmIRPOperationProfileReply ::= SEQUENCE
   {
   operationNameProfile           OperationList,
   operationParameterProfile      ParameterListOfList,
   status                         ErrorCauses
   }

GetNRMIRPVersionReply ::= SEQUENCE
   {
   versionNumberList         SupportedNRMSSVersions,
   vSEVersionNumberList      SupportedVSEVersions,
   status                    ErrorCauses
}

GeneralObjectId ::= INTEGER

IRPVersionNumber ::= GraphicString

SupportedKernelCmIRPVersions ::= SET OF IRPVersionNumber
```

```
SupportedNRMSSVersions ::= SET OF IRPVersionNumber

SupportedVSEVersions ::= SET OF IRPVersionNumber

NotificationList ::= SET OF NotificationName

NotificationName ::= GraphicString

NotifyCMSynchronizationRecommendedInfo::= SEQUENCE
   {
   baseMOClass               ObjectClass,
   baseMOInstance            ObjectInstance,
   scope                     Scope,
   notificationIdentifier    NotificationIdentifier,
   additionalText            AdditionalText OPTIONAL
   }

OperationList ::= SET OF OperationName

OperationName ::= GraphicString

ParameterListOfList ::= SET OF ParameterList

ParameterList ::= SET OF ParameterName

ParameterName ::= GraphicString

VersionNumberList ::= SupportedKernelCmIRPVersions

VSEVersionNumberList ::= SupportedVSEVersions

END –- of module TS32-664TypeModule
```

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Sep 2002	S_17	SP-020467	--	--	Submitted to TSG SA #17 for Information	1.0.0	
Dec 2002	S_18	SP-020743	--	--	Submitted to TSG SA #18 for Approval	2.0.0	5.0.0
Mar 2003	S_19	SP-030145	001	--	Add GDMO definition of notifyCMSynchronizationRecommended notification for KernelCM IRP	5.0.0	6.0.0
Jun 2003	S_20	SP-030289	002	--	Correction to notifyCMSynchronizationRecommendedInfo	6.0.0	6.1.0
Sep 2004	S_25	SP-040570	003	--	Add State Management support to Kernel CM IRP CMIP SS	6.1.0	6.2.0

History

Document history		
V6.2.0	September 2004	Publication