

Source: SA5 (Telecom Management)

Title: Rel-5 CR 32.101 (Telecommunication management; Principles and high level requirements) : Removal / Replacement of the term UMTS

Document for: Approval

Agenda Item: 7.5.3

Doc-1st-Level	Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Doc-2nd-Level	Workitem
SP-030401	32.101	023	-	Rel-5	Removal/Replacement of the term UMTS - Alignment with SA1/2 specifications	F	5.4.0	S5-032522	OAM-AR

CHANGE REQUEST

⌘ **32.101 CR 023** ⌘ rev - ⌘ Current version: **5.4.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Removal/Replacement of the term UMTS - Alignment with SA1/2 specifications		
Source:	⌘ SA5 (Michael.Truss@motorola.com, J.Schmidt@motorola.com)		
Work item code:	⌘ OAM-AR	Date:	⌘ 05/09/2003
Category:	⌘ F	Release:	⌘ Rel-5
	<i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ (1) To align with other specifications from e.g. SA1 & SA2 where 3G / 3GPP is often used now in place of UMTS (2) To show the applicability of TS 32.101 to all PLMNs (GSM, GPRS, 3GPP, 3GPP2)
Summary of change:	⌘ Removal and Replacement of the term where deemed appropriate throughout 32.101 & other editorial corrections.
Consequences if not approved:	⌘ Mis-alignment with other specifications and failure to broaden applicability of 32.101

Clauses affected:	⌘ 1, 3.1, 3.2, 4, 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2, 5, 5.1, 5.1.1, 5.1.2, 5.1.2.2, 5.1.3, 5.1.4, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.3, 6, 6.1, 6.2.5, 7, 7.1, 7.12, Annex A, Annex B, Annex C						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
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Y	N						
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Other comments:	⌘						

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Changes in Clause 1

1 Scope

The present document establishes and defines the management principles and high-level requirements for the management of [PLMNs](#)~~UMTS~~.

In particular, the present document identifies the requirements for:

- the upper level of a ~~UMTS~~-Management System;
- the reference model, showing the elements the ~~UMTS~~-Management System interacts with;
- the network operator processes needed to run, operate and maintain a ~~UMTS~~-network;
- the functional architecture of the ~~UMTS~~-Management System;
- the principles to be applied to ~~UMTS~~-Management Interfaces;

The requirements identified in the present document are directed to the further development of ~~UMTS~~-Management specifications as well as the development of ~~UMTS~~ Management products. The present document can be seen as guidance for the development of all other Technical Specification addressing the management of [PLMNs](#)~~UMTS~~.

The present document does not provide physical architectures of the ~~UMTS~~-Management System. These aspects are defined and discussed in more detail in TS 32.102 [101].

Verbal forms used to indicate requirements in the present document (e.g. "shall", "should", "may") are used in compliance with 3GPP specification Drafting Rules TR 21.801 [104].

End of Changes in Clause 1

Changes in Clause 3.1

Management Infrastructure: the collection of systems (computers and telecommunications) a [PLMN](#)~~UMTS~~ Organisation has in order to manage [its network](#)~~UMTS~~

Network Element (NE): a discrete telecommunications entity, which can be managed over a specific interface e.g. the RNC

Network Manager (NM): provides a package of end-user functions with the responsibility for the management of a network, mainly as supported by the EM(s) but it may also involve direct access to the Network Elements. All communication with the network is based on open and well-standardized interfaces supporting management of multi-vendor and multi-technology Network Elements.

Network Resource Model (NRM): an Information Service describing Information Object Classes representing the manageable aspects of network resources, e.g. an RNC or NodeB.

Operations System (OS): a generic management system, independent of its location level within the management hierarchy.

Public Land Mobile Network (PLMN): see 3GPP TR 21.905

PLMN Organisation: legal entity that is involved in the management of a telecommunications network providing mobile cellular services

Sub-Network Management Functions: functions related to a network model for a set of Network Elements constituting a clearly defined sub-network, which may include relations between the Network Elements. This model enables additional functions on the sub-network level (typically in the areas of network topology presentation, alarm correlation, service impact analysis and circuit provisioning).

Support object: object that represents a particular capability, introduced to model a service. As an example of support object, for the Alarm IRP Information Service there is the "alarm information" and "alarm list".

~~**UMTS Organisation:** legal entity that is involved in the provisioning of UMTS.~~

End of Changes in Clause 3.1

Changes in Clause 3.2

~~PLMN~~ Public Land Mobile Network
~~UMTS~~ Universal Mobile Telecommunication System

End of Changes in Clause 3.2

Changes in Clause 4 and all sub clauses

4 General

4.1 ~~UMTS~~PLMN Telecom Management

4.1.1 Basic objectives for ~~UMTS~~PLMN management

The requirements and decomposition of Telecom Management for ~~3G UMTS~~ do not differ radically from that of 2G systems. The following basic objectives to be supported by the ~~UMTS~~ management specifications have been identified:

- to be capable of managing equipment supplied by different vendors including the management systems themselves.
- to minimise the complexity of ~~UMTS~~PLMN management.
- to provide the communication between ~~UMTS~~ Network Elements (NEs) and ~~UMTS~~ Operations Systems (OS) or between ~~UMTS~~ OSs themselves via standardised interfaces (e.g. CMIP, CORBA, SNMP, etc.) as appropriate and necessary.
- to minimise the costs of managing a ~~UMTS~~PLMN-network such that it is a small component of the overall operating cost.
- to provide ~~UMTS~~ configuration capabilities that are flexible enough to allow rapid deployment of services.
- to provide integrated Fault Management capabilities.
- to simplify maintenance interventions by supporting remote maintenance operations.
- to allow interoperability between Network Operators/Service Providers for the exchange of management/charging information. This includes interoperability with other networks and services (e.g. ISDN/B-ISDN, PSTN and UPT) as well as other ~~UMTS~~PLMNs networks.

- to enable the support and control of a growing number of resources. This would allow the system to start from a small and simple configuration and grow as needed, both in size and complexity.
- to re-use existing relevant standards (e.g. GSM, IN, ISDN/B-ISDN, ITU-T, TMF etc.) where applicable.
- to support the security management of **UMTS**PLMNs (e.g. key management, access control management, operation and administration of security mechanisms) with particular emphasis on new features such as automatic roaming and packet switched services.
- to provide and support a flexible billing and accounting administration, to support charging across **UMTS**PLMNs and non-UMTS systems.
- to address the management and assessment of system performance and operation through the use of common measurements, etc. This would enable a Network Operator/Service Provider to assess actual performance against planned targets.
- to expose any information only once.
(Example: In case an operator would like to change one parameter in a cell: Then all occurrences of this parameter, e.g. transceiver frequency, hand-over relationships, performance measurements, frequency hopping control, etc., should be changed by one action only.)
- to support the restoration of an **UMTS** Operations System (e.g. resynchronisation and atomic transactions).
- to have one (1) name convention for network resources under management in the 3GPP context. To perform network management tasks, co-operating applications require identical interpretation of names assigned to network resources under management. Such names are required to be unambiguous as well.

It is acknowledged that the introduction of new architecture to support new services or the introduction of new services themselves may impact the detailed requirements of some or all of the above.

4.1.2 **UMTS**3GPP reference model

A **3GPP System**~~Universal Mobile Telecommunications System~~ (**UMTS**) is made of the following components:

- one or more Access Networks, using different types of access techniques (GSM, UTRA, DECT, PSTN, ISDN ...) of which at least one is UTRA;
- one or more Core Networks;
- one or more Intelligent Node Networks service logic and mobility management, (IN, GSM ...);
- one or more transmission networks (PDH, SDH etc.) in various topologies (point-to-point, ring, and point-to-multi-point...) and physical means (radio, fibre and copper ...).

The **UMTS**3GPP system components have signalling mechanisms among them (DSS1, INAP, MAP, SS7, RSVP,...).

From the service perspective, the **3GPP System**~~UMTS~~ is defined to offer:

- Service support transparent to the location, access technique and core network, within the bearer capabilities available in one particular case;
- User to terminal and user to network interface (MMI) irrespective of the entities supporting the services required (VHE);
- Multimedia capabilities.

4.1.3 **UMTS**3GPP provisioning entities

TS 22.101 "Services Principles" [2] identifies two major entities, which cover the set of **UMTS**3GPP functionalities involved in the provision of the **UMTS**3GPP services to the user. These are:

Home Environment: This entity holds the functionalities that enable a user to obtain **UMTS**3GPP services in a consistent manner regardless of the user's location or the terminal used;

Serving Network: This entity provides the user with access to the services of the Home Environment.

4.1.4 UMTS Management infrastructure of the PLMN

Every UMTS PLMN Organisation has its own management infrastructure. Each management infrastructure contains different functionality depending on the role-played and the equipment used by that UMTS Entity.

However, the core management architecture of the UMTS PLMN Organisation is very similar. Every UMTS PLMN Organisation:

- provides services to its customers;
- needs an infrastructure to fulfil them (advertise, ordering, creation, provisioning ...);
- assures them (Operation, Quality of Service, Trouble Reporting and Fixing ...);
- bills them (Rating, Discounting ...).

Not every UMTS PLMN Organisation will implement the complete Management Architecture and related Processes. Some processes may be missing dependent on the role a particular UMTS Organisation is embodying. Processes not implemented by a particular UMTS Organisation are accessed via interconnections to other UMTS organisations, which have implemented these processes (called X-interfaces in the ITU-T TMN architecture).

The Management Architecture itself does not distinguish between external and internal interfaces.

4.2 ITU-T TMN

ITU-T TMN (Telecommunications Management Network standard from the ITU-T), as defined in ITU-T Recommendation M.3010 [1], provides:

- an architecture, made of OS (Operations Systems) and NEs (Network Elements), and the interfaces between them (Q, within one Operator Domain and X, between different Operators);
- the methodology to define those interfaces;
- other architectural tools such as LLA (Logical Layered Architecture) that help to further refine and define the Management Architecture of a given management area;
- a number of generic and/or common management functions to be specialised/applied to various and specific ITU-T TMN interfaces.

The UMTS PLMN Management Architecture is based on ITU-T TMN, and will reuse those functions, methods and interfaces already defined (or being defined) that are suitable to the management needs of a UMTS PLMN. However, the UMTS Management needs to explore the incorporation of other concepts (other management paradigms widely accepted and deployed) since:

- UMTS incorporates other technologies to which ITU-T TMN is not applied fully;
- UMTS faces new challenges that ITU-T TMN does not address today;

The ITU-T standards are mainly concentrated in the element management and network management layers. They have been developed from the bottom up, making it difficult to apply the standards as part of a business case. It is also difficult to have a customer-centric focus.

An example of another management approach paradigm that is will be employed to try and address these difficulties is the Telecom Operations Map from TeleManagement Forum (TMF). The Telecom Operations Map, using the TMN model as a foundation, addresses operation support and management for any communications service from a top down customer oriented standpoint.

It can be noted that these concerns are applicable to other telecommunication areas as well as to UMTS, it is expected that the eventual evolution of ITU-T TMN will cover this ground. Indeed, most of the above concepts are already being taken into account by ITU-T TMN evolution (protocols and methodologies).

End of Changes in Clause 4 and all sub clauses

Changes in Clause 5 and all sub clauses
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5 Architectural framework

5.1 UMTS Management Reference Model and Interfaces

5.1.1 Overview

Figure 1 illustrates the UMTS Management Reference Model. It shows the UMTS Operation System interfacing with other systems.

The present document (and the rest of the 3GPP UMTS Management detailed specifications) addresses the UMTS Operations System (function and architecture wise) and the interfaces to the other systems (information and protocol wise).

The present document does not address the definition of any of the systems, which the UMTS Operations System may interface to. The rest of the 3GPP specifications regarding UMTS Management will not cover them either.

It is not the approach (nor it is possible) to re-define the complete management of all the technologies that might be used in the provision of UMTS a PLMN. However, it is the intention to identify and define what will be needed from the perspective of UMTS management.

A number of management interfaces in a UMTS PLMN network are identified in figure 1, namely:

- 1) between the Network Elements (NEs) and the Element Manager (EM) of a single UMTS PLMN Organisation;
- 2) between the Element Manager (EM) and the Network Manager (NM) of a single UMTS PLMN Organisation;

NOTE: In certain cases the Element Manager functionality may reside in the NE in which case this interface is directly from NE to Network Manager). These management interfaces are given the reference name Itf-N and are the primary target for standardization.

- 3) between the Network Managers and the Enterprise Systems of a single UMTS PLMN Organisation;
- 4) between the Network Managers (NMs) of a single UMTS PLMN Organisation;
- 5) between Enterprise Systems & Network Managers of different UMTS PLMN Organisations;
- 6) between Network Elements (NEs).

The present document focuses primarily on management interfaces of Type 2 and to a lesser extent on management interfaces of Type 1 from the above list, while interfaces of Types 3 & 5 will be identified in the present document. Detailed specification of these interfaces is For Further Study (FFS). Interfaces of type 4 & 6 are beyond the scope of standardisation.

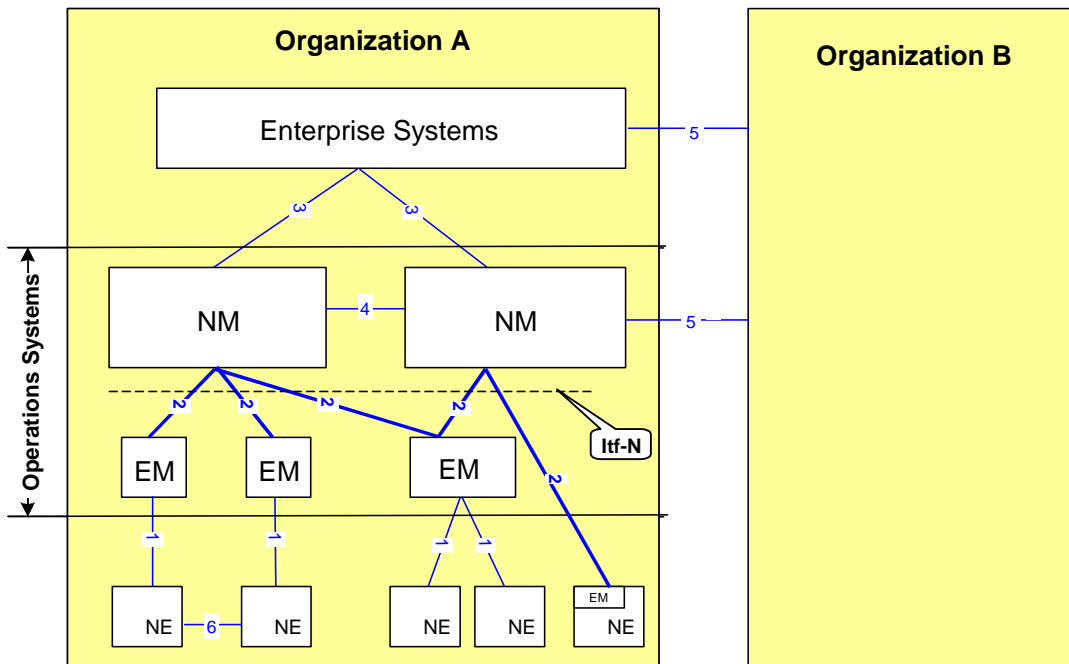


Figure 1: Management System Interactions

5.1.2 Interfaces from Operations Systems to NEs (Type 1 & 2)

In some cases, the management interfaces to NEs have been defined bottom-up, trying to standardise the complete O&M functionality of the various NEs.

For **UMTS/PLMN** management, a top-down approach will be followed to streamline the requirements from the perspective of **UMTS** Operators top priority management processes.

It is assumed that this will not fully cover the O&M functionality of all NE types **in-UMTS** at once; therefore a part of the functionality will be phased for further work and consideration. Some proprietary solutions (local and/or remote) will be needed in the interim. The rationale of this approach is not only the best use of resources, but also to follow a pragmatic step-wise approach that takes into account the market forces (the manufacturers and operators capabilities). A further rationale is to define clear and easy-to-agree steps that allow Management functionality to be implemented in the same time frame as the telecom functionality in the network (i.e. to synchronise the management and network releases).

The approach for NE Management Interfaces will be to concentrate on protocol independent information models, allowing a mapping to several protocol suites. The rationale is:

- due to the convergence of Information and Telecommunication technologies **in-UMTS**, it is required to work on a more open approach (acknowledging the market status and foreseen evolutions);
- the life cycle of information flows is 10 to 20 years, while that of protocols is 5 to 10 years;
- developments in automatic conversion from information models to various protocols/technologies will allow a more pragmatic and open approach (e.g. UML to GDMO, UML to IDL).

However, it is the intention to at least recommend one mapping for each interface.

5.1.2.1 Interfaces from EM Operations Systems to NEs (Type 1)

The approach for NE Management Interfaces of Type 1 will be to allow the use of certain Management Application Protocol Suites (see Annex A for a list of Management Protocol Suites).

5.1.2.2 Interfaces from NM Operations Systems to NEs (Type 2)

The approach for NE Management Interfaces of Type 2 will be to concentrate on protocol independent information models, allowing a mapping to several protocol suites. The rationale is:

- due to the convergence of Information and Telecommunication technologies ~~in UMTS~~, it is required to work on a more open approach (acknowledging the market status and foreseen evolutions);
- the life cycle of information flows is 10 to 20 years, while that of protocols is 5 to 10 years;
- developments in automatic conversion from information models to various protocols/technologies will allow a more pragmatic and open approach (e.g. UML to GDMO, UML to IDL).

However, it is the intention to at least recommend one mapping for each interface.

Figure 2 shows the management interfaces of one part of the 3GPP System UMTS, (the Radio Network), by way of illustration of interfaces of types 1 and 2.

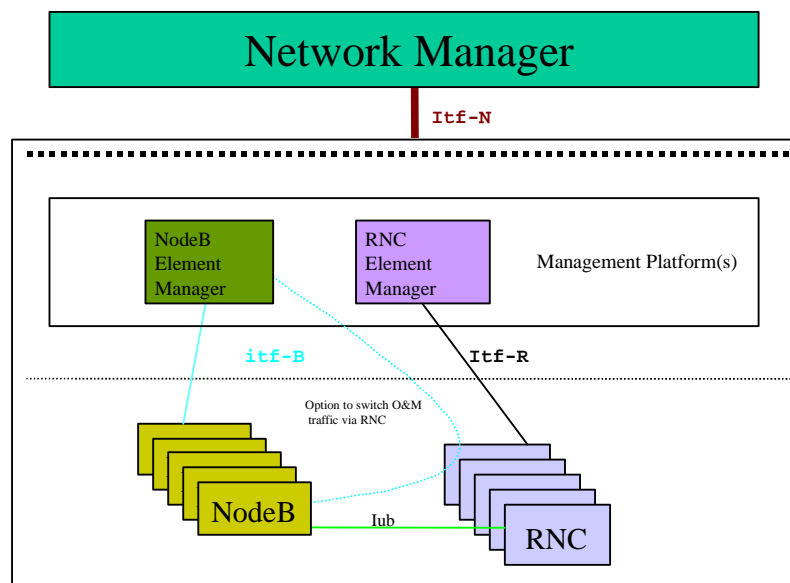


Figure 2: Radio Network Management Interfaces

Figure 2 identifies the following Management Interfaces:

- Itf-B - between Node B & its Manager (physically, this may be a direct connection or via the RNC) (type 1).
- Itf-R - between RNC & its Manager (type 1).
- Itf-N – between the Network (Element Manager or NEs with an embedded EM) & Network Manager (type 2).

5.1.3 Interfaces to Enterprise Systems (Type 3)

The approach is to define a UMTS Management structure that fully fits into the enterprise processes needs of the UMTS PLMN Organisations. One of the essential issues of today's way of running telecommunications businesses is integral operation (e.g. customer care, from service subscription to billing, from order fulfilment to complaint management).

Enterprise Systems are those Information Systems that are used in the telecommunication organisation but are not directly or essentially related to the telecommunications aspects (Call Centres, Fraud Detection and Prevention Systems, Invoicing etc.).

Standardising Enterprise Systems is out of the scope of 3GPP work, since it involves many operator choices (organisational, etc.) and even regulatory. Also Enterprise Systems are often viewed as a competitive tool. However, it is essential that the requirements of such systems are taken into account and interfaces to the **UMTS** Operations Systems are defined, to allow for easy interconnection and functional support.

5.1.4 Interfaces to ~~other~~ Operations Systems in other Organisations (Type 5)

UMTS**PLMN** Management considers integrally the interaction with~~between~~ the Operations Systems of other legal entities for the purpose of providing **UMTS****Mobile** services.

There are two major types of interfaces to other management systems:

- 1) ~~to other UMTS~~ To the Operations Systems of another PLMN Organisation (~~i.e. other from other UMTS operators~~);
- 2) ~~to other~~ To the Operations Systems of a non-PLMN Organisation (~~i.e. to non-UMTS operators~~).

The first type deals with co-operation to provide **UMTS****Mobile** services across a number of **UMTS****PLMN** networks (e.g. roaming related interactions). The second type deals with client-server relationship to other operators (e.g. to leased lines providers, to added value service providers, etc.).

The approach that will be followed is to identify and define integral processes, not taking into account in the first step, how many operators or operations systems might be involved, but rather concentrating on the interactions between them (i.e. assuming an UMTS operator encompasses all functionalities). A further step will be to consider and define extra requirements (security, confidentiality etc.) when part of the process involves interactions with other operators Operations Systems (OSs).

5.1.5 Inter-NE Interfaces (Type 6)

Interfaces between Network Elements are sometimes used to carry management information even though this may not be the primary purpose of the interface. An example in a 3G network is the I_{ub} interface between Node-B and RNC (see figure 2 above). This type of interface is not within the scope of this specification, though potential impacts upon it should be considered.

5.2 Interface levels

5.2.1 Overview

The Management interfaces are studied here from five different perspectives or levels:

- 1) Logical (information model and flows used in the relationship manager-agent, or equivalent);
- 2) Solution Set (SS) Level;
- 3) Application protocol (end-to-end, upper layers protocol running between manager-agent, or equivalent);
- 4) Networking protocol (lower layer protocols carrying the information in/out the manager and agent, or equivalents);
- 5) Physical (mapping of the manager and agent, or equivalents, roles into physical entities).

5.2.2 Logical level

This level covers the mutual and conceptual knowledge of entities being connected by a given interface.

For type 2 interfaces (such as Itf-N in Figure 2 above) interactions at this level are fully standardised by 3GPP in terms of protocol independent Network Resource Models (static information definition) and IRP Information Services (information flows) where available. These protocol-independent Network Resource Models and IRP Information Services are hereafter referred to as IRP Information Models (Integration Reference Point Information Models).

5.2.3 Solution Set (SS) level

For an IRP Information Model at the logical level there will be at least one Solution Set defined. A Solution Set is a mapping of the Information Service to one of several technologies (for a full definition refer to subclause 3.1).

See annex C for the valid [UMTS3GPP](#) Management IRP Solution Sets (see also ITU-T Recommendation M.3013-2000 [102]).

5.2.4 Application Protocol level

This level covers the set of primitives used to pass information across a given interface and the means to establish associations between the application entities (including the related addressing aspects) across a given interface.

Generally, the Application Protocol Suite used for the interaction between entities across a given interface is optional within the valid [UMTS3GPP](#) Management Application Protocol Suites (see Annex A for a list of [UMTS3GPP](#) Management Protocol Suites). However, in the case of interfaces of type 2 (such as Itf-N in figure 2 above) at least one of those protocol suites will be chosen as the standard protocol suite.

5.2.5 Networking Protocol level

Whatever standardised protocol suite at the networking level that is capable of meeting the functional and operational requirements (including the network addressing aspects) of the Logical and Application Protocol levels of a given [UMTS](#) management interface, is a valid Networking Protocol for that interface.

A number of requirements shall be met by the Networking Protocol, as follows:

- capability to run over all supported bearers (leased lines, X.25, ATM, Frame Relay ...);
- support of existing transport protocols and their applications, such as OSI, TCP/IP family, etc.;
- widely available, cheap and reliable.

The Internet Protocol (IP) is a Networking Protocol that ideally supports these requirements. IP also adds flexibility to how management connectivity is achieved when networks are rolled out, by offering various implementation choices. For instance, these may take the form of:

- Dedicated management intranets.
- Separation from or integration into an operator's enterprise network.
- Utilisation, in one-way or another, of capacities of the public Internet and its applications or other resources.

5.2.6 Physical level

Though the interaction at the logical level takes place between the [UMTS](#) Management System and the [UMTS](#) NEs, it is left to the implementer's choice the possibility to use the Q-Adapter (~~see Note~~) concept of ITU-T TMN Architecture as physical implementation (as defined in ITU-T Recommendation M.3010 [1]).

~~NOTE:—Q Adapter needs to be interpreted here in a wider sense than in ITU-T Recommendation M.3010 [1], since UMTS will consider other application protocols different to CMIP.~~

The present document does not preclude the usage of Q-Adapters at other [PLMN Management interfaces](#).~~interfaces of the UMTS Management.~~

5.3 [3GPP](#) Compliance conditions

For a [UMTS3GPP](#) entity (Management System or NE) to be compliant to a given [UMTS](#) Management Interface, all the following conditions shall be satisfied:

- it implements the management functionality following the Information Model and flows specified by the relevant [3GPP UMTS](#) Management Interface Specifications applicable to that interface;

- it provides at least one of the IRP Solution Sets ([see Annex C where available](#)) related to the valid Application Protocols specified by 3GPP ~~UMTS~~ Application Protocols for that interface (see annex A). For each interface at least one of the valid protocols will be recommended;
- it provides at least one standard networking protocol ([see Annex B](#));
- in case the entity does not offer the management interface on its own, a Q-Adapter shall be provided. This Q adapter shall be provided independently of any other ~~UMTS~~ NE and/or ~~UMTS~~ Management System.

End of Changes in Clause 5 and all sub clauses

Changes in Clause 6 and 6.1

6 UMTSPLMN Management Processes

6.1 Process decomposition

The present document details the general aspects of an UMTSPLMN Management system. It describes primarily the management processes that collectively support Customer Care Service Development and Operations, and Network and Systems Management Processes in an UMTS network.

These management processes are based on the widely accepted Telecom Operations Map from the TeleManagement Forum [100]. The Telecom Operations Map uses the TMN Model as a foundation as defined in the ITU-T Recommendation M.3010 [1]

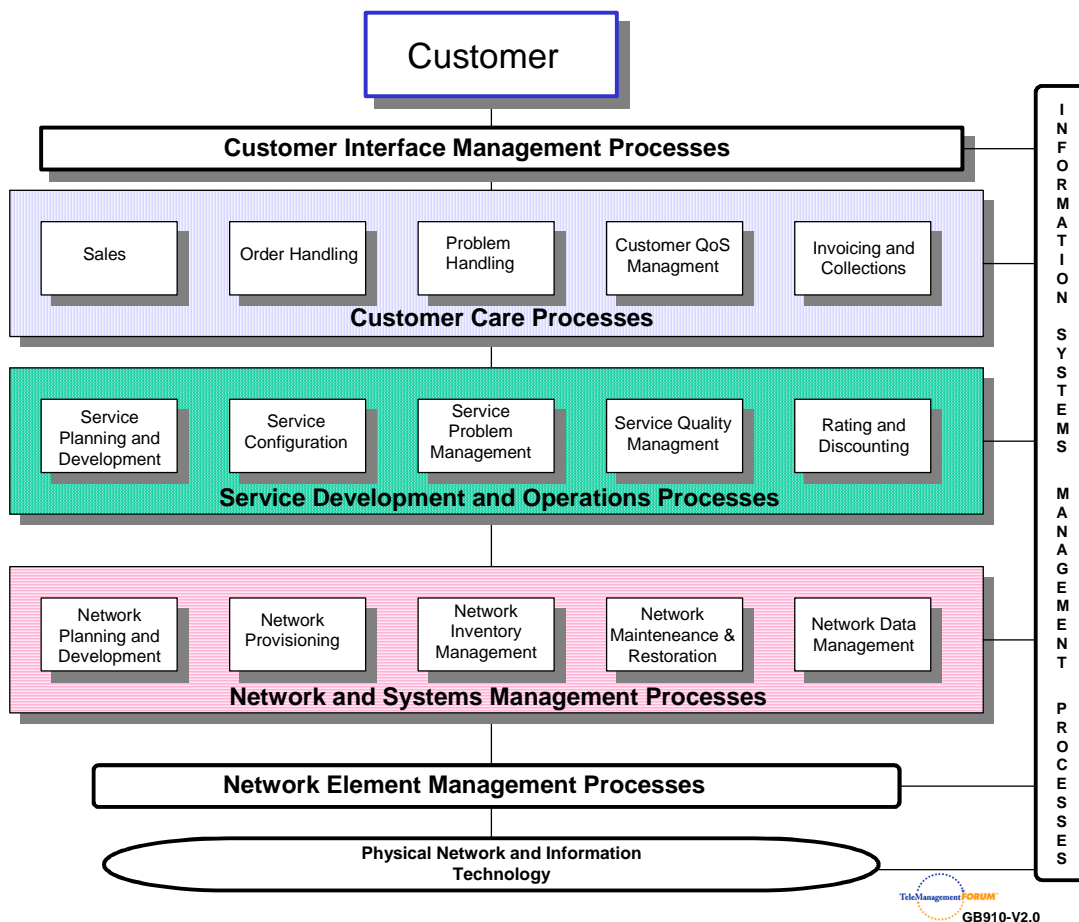


Figure 3: Telecom Operations Map Business Process Model (* imported from [100])

The following clauses give a short description of each of the UMTS management processes introduced in the "TMF Telecom Operations Map" [100]. To see a more detailed description and process spider diagram for each process, refer to "TMF Telecom Operations Map"[100].

End of Changes in Clause 6 and 6.1

Changes in Clause 6.2.5

6.2.5 Customer QoS Management

This process encompasses monitoring, managing and reporting of **UMTS** Quality of Service (QoS) as defined in Service Descriptions, Service Level Agreements (SLA), and other service-related documents.

End of Changes in Clause 6.2.5

Changes in Clause 7 and 7.1

7 **UMTS**PLMN Management Functional Architecture

7.1 TM Architectural aspects

The basic aspects of a TM architecture, which can be, considered when planning and designing a TM are:

- the functional architecture;
- the information architecture;
- the physical architecture.

The management requirements from the business needs are the base for the functional architecture, which describe the functions that have to be achieved. The information architecture defines what information that has to be provided so the functions defined in the functional architecture can be achieved. The physical architecture has to meet both the functional architecture and the information architectures. These relationships are shown in figure 5.

The present document addresses the Functional Architecture, the Physical Architecture is addressed in TS 32.102 [101].

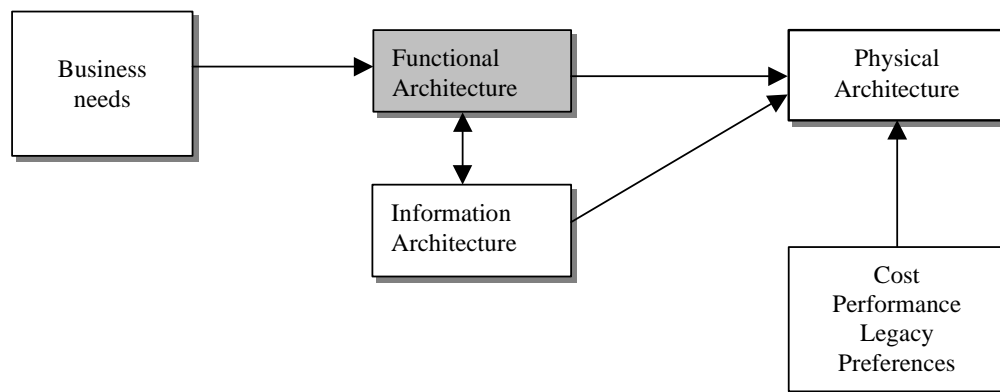


Figure 4: Architectural relationship

The present document details the **UMTS**PLMN Management Functional Architecture.

All **UMTS** management processes have functions in several management areas. By identifying only those processes and interfaces relating to a certain management function, for example performance management, it is possible to take a slice through the Telecom Operations Map that details the functional architecture for performance management, this will be the approach taken by the present document.

The management functions are:

- Performance management;
- Roaming management;
- Fraud management;
- Fault management;
- Security management;
- Software management
- Configuration management;
- Accounting management;
- Subscription management;
- Quality of Service (QoS) Management (see informative annex D);
- User equipment management.

End of Changes in Clause 7 and 7.1

Changes in Clause 7.12

7.12 O&M of the **UMTS**PLMN "Management Infrastructure"

As described earlier in the present document, each **UMTS**PLMN organisation has a **UMTS** management infrastructure consisting of a collection of systems (computers and telecommunications) - a TMN in ITU-T parlance - used to manage its **UMTS** network. Though this management network is logically distinct from the **UMTS**PLMN **network**, the operations systems and supporting data communications network comprising it have the same management needs as described for **UMTS** network elements and where possible should be managed using the same principles and similar management processes and functionality.

End of Changes in Clause 7.12

Changes in Annexes A, B & C
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Annex A (normative):

~~UMTS~~3GPP Management Application Layer Protocols

The valid Management Application Layer Protocols for ~~UMTS~~3GPP are:

- CMIP (see references [20], [21]);

NOTE: Normative references relating to running CMIP over OSI application, presentation and session layers are [9] - [12] and [23] - [42].

- SNMP (see reference [6]);
- CORBA IIOP (see references [8] and [52]).

The valid Application Layer Protocols for Bulk Transfer are:

- FTAM (see references [13] – [19]);
- ftp (see reference [4]);
- tftp (see reference [5]).

Annex B (normative):

UMTS3GPP Management Network Layer Protocols

The valid Network Layer Protocols for the Management of UMTS3GPP are:

- IP (see reference [48]);
- X.25 (see reference [22]).

NOTE 1: IP is the recommended Networking Protocol.

NOTE 2: Normative references relating to ISO Transport over TCP-IP are [46] and [47] and ISO Transport over X.25 are [43] - [45].

Annex C (normative):

UMTS3GPP Management IRP Solution Sets

The valid IRP Solution Sets for the Management of UMTS3GPP on the Itf-N interface are:

- GDMO (CMIP);
- CORBA (IDL).

End of Changes in Annexes A, B & C

Annex E is included here only to verify that the correct (latest) version of the TS has been used for this CR, It is not otherwise intended to be part of the CR.

Annex E (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Dec 1999	S_06	SP-99577	--	--	Approved at TSG SA #6 and placed under Change Control	--	3.0.0
Mar 2000	S_07	SP-000014	001	--	Clarify use of X.25 as a Network Layer Protocol	3.0.0	3.1.0
Mar 2000	S_07	SP-000014	002	--	Correction of IRP-related terminology	3.0.0	3.1.0
Mar 2000	S_07	SP-000014	003	--	Clarification of Software Management	3.0.0	3.1.0
Mar 2000	--	--	--	--	Cosmetic	3.1.0	3.1.1
Jun 2000	S_08	SP-000225	004	--	Add and Update Correct Normative Reference List	3.1.1	3.2.0
Jun 2000	S_08	SP-000226	005	--	Terminology corrections	3.1.1	3.2.0
Dec 2000	S_10	SP-000522	006	--	Update references to allow both CORBA Versions 2.1 and 2.3	3.2.0	3.3.0
Mar 2001	S_11	SP-010022	007	--	Removal of Reference to 32.105 (not available for R99).	3.3.0	3.4.0
Mar 2001	S_11	--	--	--	Automatic upgrade to Rel-4	3.3.0	4.0.0
Apr 2001	--	--	--	--	Created Rel-4 from the latest R99 version (3.4.0 instead of 3.3.0)	3.4.0	4.0.1
Jun 2001	S_12	SP-010231	008	--	Scope update for Rel4	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	009	--	Updates and Corrections for Rel4	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	010	--	Alignment with TMF GB910 and associated Editorial improvements	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	011	--	Update and re-organisation of clause 8 (Functional Architecture)	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	012	--	Introduce Subscription Management	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	013	--	Introduction of QoS Management Annex	4.0.1	4.1.0
Jun 2001	S_12	SP-010231	014	--	Update the definition of IRP terminology	4.0.1	4.1.0
Jun 2001	S_13	SP-010465	015	--	Reference Corrections	4.1.0	4.2.0
Mar 2002	--	--	--	--	Cosmetics	4.2.0	4.2.1
Mar 2002	S_15	SP-020013	016	--	Correction and update to QoS Management (alignment on Policy Management with S2, CN3 in 23.207, 29.207)	4.2.1	5.0.0
Mar 2002	S_15	SP-020013	017	--	Introduction of Subscriber and Equipment Trace Management	4.2.1	5.0.0
Mar 2002	S_15	SP-020013	018	--	Update of Accounting Management to cover the IMS (alignment with SA5's 32.200 Charging management; Charging Principles)	4.2.1	5.0.0
Sep 2002	S_17	SP-020449	019	--	Introduction of a new subclause (7.12) on O&M of the UMTS "Management Infrastructure"	5.0.0	5.1.0
Dec 2002	S_18	SP-020726	020	--	Aligning IRP related terminology with SA5's SWGC IRP specifications (32.6xy)	5.1.0	5.2.0
Mar 2003	S_19	SP-030043	021	--	Align QoS Terminology with SA2's 23.207 & CN3's 29.207	5.2.0	5.3.0
Jun 2003	S_20	SP-030266	022	--	Correction and update of Management System Interactions	5.3.0	5.4.0