ETSI TS 132 531 V8.2.0 (2011-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Software management (SwM);
Concepts and Integration Reference Point (IRP) Requirements
(3GPP TS 32.531 version 8.2.0 Release 8)

Reference
RTS/TSGS-0532531v820

Keywords
LTE, UMTS

ETSI

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Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification 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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  - 1 presented to TSG for information;
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  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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; as identified below:

32.531: Software management; Concepts and Integration Reference Point (IRP) Requirements

32.532: Software management Integration Reference Point (IRP); Information Service (IS)

32.533: Software management Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set (SS)

1 Scope

The present document describes the concepts how SWM of NEs works and what IRP requirements need to be met to support this functionality.

In the 3GPP Rel-8 the present document focuses on automated software management of eNBs.

2 References

The following documents contain provisions which, 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 TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

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

[4] 3GPP TR 32.816: "Telecommunication management; Study on Management of Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Evolved Packet Core (EPC)".

3 Definitions and abbreviations

For the purposes of the present document, the terms and definitions given in TS 32.101 [2], TS 32.102 [3] and TS 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TS 32.101 [1], TS 32.102 [2] and TS 21.905 [5], in that order.

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Software Management: Activities to control which software is available and/or active in a network element.

Automated Software Management: Software Management functionalities which are performed without being triggered by a (SWM) IRP Manager.

Non-Automated Software Management: Software Management functionalities which are performed individually by a (SWM) IRP Manager over Interface-N.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

ASWM	Automated Software Management
NASWM	Non-Automated Software Management

SWM	Software Management
NE	Network Element

4 Concepts and background

4.1 Business Level Requirements

4.1.1 Business Level Requirements 1

REQ_SW_CON_1 The software download functions used during the establishment of a new NE in the network should be used also for software upgrade.

4.1.1.1 Actor roles

FFS

4.1.1.2 Telecommunications resources

FFS

4.1.1.3 High-level use cases

FFS

4.1.2 Business Level Requirements 2

REQ_SW_CON_2 The IRPManager should have monitoring and interaction capabilities regarding the software download, installation, activation and fallback in/to the NE.

4.1.2.1 Actor roles

FFS

4.1.2.2 Telecommunications resources

FFS

4.1.2.3 High-level use cases

FFS

4.1.3 Business Level Requirements 3

REQ_SW_CON_3 The software installation shall have no or limited service impacts.

4.1.3.1 Actor roles

FFS

4.1.3.2 Telecommunications resources

FFS

4.1.3.3 High-level use cases

FFS

4.1.4 Business Level Requirements 4

REQ_SW_CON_4
The IRPManager shall be able to predefine which specific software version, component or software package shall be downloaded to one or more eNodeBs during automated software management procedure.

4.1.4.1 Actor roles

FFS

4.1.4.2 Telecommunications resources

FFS

4.1.4.3 High-level use cases

FFS

4.2 Specification level requirements

4.2.1 Specification level requirement on general SWM

REQ_SWM_FUN_1
If a software installation/activation fails, a software fallback should be done.

REQ_SWM_FUN_2
It shall be possible for the IRPManager to retrieve information about the SW which is present in an NE or a group of NEs.

REQ_SWM_FUN_3
It shall be possible for the IRPManager to monitor changes in the SW which is present in an NE (newly downloaded/installed/activated/fallback).

REQ_SWM_FUN_4
It shall be possible for the IRPManager to receive alarms in case of failures during the SW-download/installation/activation/fallback.

REQ_SWM_FUN_5
It shall be possible for the IRPManager to retrieve information about the SW which is available for an NE.

REQ_SWM_FUN_6
It shall be possible for the IRPManager to instruct the IRPAgent to trigger a SW fallback in an individual NE or groups of NEs.

4.2.1.1 Actor roles

FFS

4.2.1.2 Telecommunications resources

FFS

4.2.1.3 Use cases

FFS

4.2.1.3.1 Use case 1

FFS

4.2.2 Specification level requirement on Automated SWM

REQ_ASWM_FUN_1
It shall be possible for an IRPManager to retrieve
- information regarding how an NE or a group of NEs behaves during ASWM, i.e. in which sequence the essential steps of ASWM are executed
- information regarding where the IRPManager can interact with ASWM - by suspending the ASWM process at one or more ASWM stop points.
Steps, their sequence and their stop point qualification are not imposed by the standard.

REQ_ASWM_FUN_2
If choices for stop points to suspend the SWM process are offered, then it shall be possible for an IRPManager to choose/select among them where it will suspend (stop) a SWM process (i.e. to ensure fulfillment of pre-conditions for the step like the fulfillment of the presence of required input data for the step).
The IRPManager shall be able to read or select or de-select the stop points offered.
The IRPManager shall be informed about the availability of new SW, about the creation and deletion of a profile which is a holder of information regarding the offered SWM steps, the offered sequence of the steps and the configuration steps stop points.
The IRPManager should be able to change the content of a created profile and be informed about the change.

REQ_ASWM_FUN_3
It shall be possible for an IRPManager to resume a suspended ASWM process.

REQ_ASWM_FUN_4
It shall be possible for IRPManager to retrieve information about the progress of ASWM.

REQ_ASWM_FUN_5
The IRPAgent should send a notification when the ASWM process
- was suspended
- was resumed
- was terminated

REQ_ASWM_FUN_6
It shall be possible for an IRPManager to terminate a currently ongoing ASWM process for one or multiple NEs. After a termination it is not possible to resume the ASWM process.

REQ_ASWM_FUN_7
In order to declare the SW activation succeeded, a self test should have been completed.

REQ_ASWM_FUN_8
If the software activation fails, information documenting the reasons for the failure should be logged, to support the trouble shooting.

4.2.2.1 Actor roles

FFS

4.2.2.2 Telecommunications resources

FFS

4.2.2.3 Use cases

4.2.2.3.1 Use case Self-Configuration

Use Case Stage	Evolution / Specification	<<Uses>> Related use
Goal (*)	Supply an eNodeB with the latest applicable software in the course of self-configuration	
Actors and Roles (*)	FFS	
Telecom resources	The E-UTRAN/EPC network including its OSS.	
Assumptions	IP network connectivity exists between the eNodeB and the OAM (sub) systems providing support for the self-configuration process and for automated software management.	
Pre conditions	The eNodeB is physically installed and physically connected to an IP network.	
Begins when	The self-configuration process reaches the point where the software version for the new eNB was be determined and needs to be delivered to the eNB.	
Step 1 (*) (M|O)	[SU1] The software is downloaded into the eNodeB. [SU2] The SW is installed on the eNB. [SU3] The SW is activated on the eNB. [at least one of SU3/4 shall be done] [SU4] The inventory system in the OAM is informed that a new software for this eNodeB is in the field. [SU5] The network resource models visible over Itf-N are updated	
Ends when (*)	Ends when all steps identified above are successfully completed or when an exception occurs.	
Exceptions	FFS.	
Post Conditions	The software is ready for usage in the eNB.	
Traceability (*)		

4.2.2.3.1 Use case Automated Software Update

Use Case Stage	Evolution / Specification	<<Uses>> Related use
Goal (*)	Supply the latest applicable software to an eNB which is already running in the network.	
Actors and Roles (*)	FFS	
Telecom resources	The E-UTRAN/EPC network including its OSS.	
Assumptions	IP network connectivity exists between the eNodeB and the OAM (sub) systems providing support for the automated software update process.	
Pre conditions	FFS	
Begins when	New software is provided for an eNB.	
Step 1 (*) (M|O)	[SU1] Information about the availability of new software is provided to the OAM (sub)system. [SU2] The software is downloaded into the eNodeB. [SU3] The SW is installed on the eNB. [SU4] The SW is activated on the eNB. [at least one of SU3/4 shall be done] [SU5] The inventory system in the OAM is informed that a new software for this eNodeB is in the field. [SU6] The network resource models visible over Itf-N are updated	
Step n (M|O)		
Ends when (*)	Ends when all mandatory steps identified above are successfully completed or when an exception occurs.	
Exceptions	FFS.	
Post Conditions	The eNodeB can use the new software.	
Traceability (*)		

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-12	SP-42	SP-080715	--	--	Submitted to SA#42 for information and approval	1.0.0	8.0.0
2009-03	SP-43	SP-090213	001	--	Correction of clause numbering	8.0.0	8.1.0
2010-12	SP-50	SP-100831	012	--	Add missing requirement to indicate availability of new SW	8.1.0	8.2.0

History

Document history		
V8.1.0	April 2009	Publication
V8.2.0	January 2011	Publication