3GPP TSG SA WG3 Security — S3#11 **S3-000175**

Mainz, Germany,
22-24 February 2000

Agenda Item: **7.4**

Source: **BT**

Title: **3G Capabilities and Security Review Framework (Draft)**

Document for: **Discussion**

Version: **0.1** **31st Jan 2000**

1 Introduction

A review of the 3GPP specifications from other groups is to be carried out to ensure that the correct interpretation of the security requirements has been made. It has been suggested that instead of looking at individual specifications, S3 delegates would investigate features or capabilities of the 3G, which may result in considering a group of related specifications. This document lists the most important capabilities and suggests a framework that could be used to ensure consistency in the security analysis of these capabilities.

2 Security Review Framework

1 Architectural Issues

1) Describe the overall security approach for the 3G capability, including any assumptions about the operating environment and threats.

2) Describe the Authentication mechanisms for network elements

3) Describe any hard limits in the security features that impact upon scalability.

4) Describe the impact that security features will have upon availability, resilience and performance.

5) Identify critical security enforcing functionality and describe its role.

6) Describe any data repositories and the class of data stored along with any security requirements.

7) Describe the network management protocols intended to be utilised for the system and how the architecture ensures they cannot be misused to subvert the system

8) Provide a description of trust relationships if the system relies upon any trust relationships between components.

9) Describe how the platform prevents end user access to carrier or service provider functionality and potential vulnerabilities.

2 Confidentiality

1) Describe the platform's ability to support the concepts of modular security and if it is possible to replace algorithms whilst the platform is in service and in full operation.

2) Describe if the platforms modular approach to security permits operators to replace algorithms with their own cryptographic algorithms.

3) Describe if it is possible to provide services that do not permit the service provider to read customer data.

3 Integrity

1) Describe the mechanisms used to support integrity checking of data and comment on the strength of these mechanisms.

4 Availability

1) Describe the impacts if all terminals were to log on, or be updated simultaneously.

2) Describe how the system is resistant to attempts to deny service by commonly known techniques.

3) Describe the potential single points of failure, such as the AuC, DNS or other components, which would have a substantial impact on the system.

4) Describe the disaster/data recovery procedures and options.

5 Identification and Access Control

1) Describe how the service provides access to service management and service creation functionality by validation, verification and authentication prior to processing requests.

2) Describe the separation of management and control access from user access.

3) Describe how access control mechanisms for management and control are separated from access control mechanisms used to provide service.

4) Describe the management of all critical security enforcing equipment on a channel separate to that providing service. - Out Of Band management?

6 Audit & Accountability

1) Describe the tools available and mechanisms required for implementing and managing an end to end audit trail.

2) Describe mechanisms used to detect fraud and their fraud management capabilities.

3 3G Capabilities

1 Speech

In CS domain only
Possibly VoIP in PS domain.
Will VoIP be run to the terminal or does this only refer to the network side

2 Data

Circuit switched bearers to 64kbit;
Packet switched to 2Mbit (max peak capability, not real time)
Packet switched bearers to 2Mbit (max peak capability, real time)
Multicall capability to provide multiple 64Kbit circuit switched bearers

3 SMS

4 FAX

Non-real time via toolkits (Japanese require end-to-end real time service)
Transparent G3 FAX (as per 03.45 v8.0.0) is only supported for GSM R99

5 Video (high quality real-time)

Standardised video codec not available in R99 and bandwidth not available in CS domain; PS not capable of real time transfer by R99.
Anticipated will be available in R2000 with a standardised video codec over PS domain.

6 Video (low quality, real-time)

Possibly, using appropriate software and limited CS bandwidth however standardised video codec not available in R99.

7 Video (non real-time, streaming)

With appropriate software codec that can be downloaded from 3rd party source (will require MExE capability in terminal).

8 Multi-media

How much control (e.g. add, drop in call) not yet clear. Note that only H324m within UDI CS bearer, transparent only will be available.
Full control of multi-media including adds, drop during call & for handover
Multi-media messaging

9 Audio

Audio - high quality speech/conferencing (real time)
Audio – music, download of high quality "music clips" (streaming)
Appropriate software in the terminal. Not codec dependent.

10 W-AMR codec target is R00,.

11 Cell Broadcast

12 SoLSA

Provision of GSM version of SoLSA in UTRA not possible – need other mechanisms to provide equivalent service.

13 Supplementary Services

GSM Ph 1& 2 SS for CS domain (real time services)
Some enhancements proposed to Call Forwarding & CLI services
GSM Ph 1& 2 SS for PS domain (supporting real time services)
Which Supplementary Services can bypass security features in S3 architecture?

14 PMR capability (equivalent to GSM ASCI services)

15 Handover –

UMTS/GPRS (real time)
UMTS/IMT2000
Handover – UMTS/UMTS
UMTS/GSM CS
UMTS/GPRS (non real time)

16 Roaming

On to GPRS, GSM, other UMTS
Standardised roaming capability to other technologies e.g. cmda2000, IS-95, IS-136?

17 Network Selection

Based on existing GSM mechanisms.
Selection based on network operator defined algorithm may not be completed for R99.
More advanced selection capabilities including algorithm that takes into account services available
Mode Selection

18 Location Services

Location Services – cell id based
Location services – mobile location based (geographic)

19 VHE/OSA

20 SIM Application Toolkit

USAT is in scope but some functionality might not be included

21 OTHERS

Multi-Call
No encryption case
AT commands
Alternative AT commands
Advanced Cell Broadcast
CAMEL Phase 3
Interworking GSM MAP with ANSI IS-41 core networks
MAP Security
Tandem-Free for AMR
Transcoder-Free (out of band signalling)
Support of transcoder in CN
Charging issues
Configuration Management
Fault management
Inter-operation between S5 O&M and RAN O&M
Layer 3 segmentation
Turbocharger
Authentication Failure message report
GLR
Enhanced User Confidentiality
Universal Geographical Area Description (GAD)
No valid keyset in MS
DS-41 Extensions

22 UE test specs for:

FDD
TDD
Protocols
ATS
UE Test Environment
UE Test Interface
UE Test Specs – proforma
UE Electromagnetic Compatibility
UE Capabilities
UE Multiplexer
UICC/ME Interface
USIM
UICC API
UICC Interface Test
UICC Test
Base Station testing

Status list of Specifications and Reports after TSG SA Meeting #6 (December 1999 Release)

Type	Number	Title	current_version	Planned / achieved	WG	editor
TS	21.101	3rd Generation mobile system Release 1999 Specifications	2.2.0	Dec-99	S	John M Meredith
TS	21.111	USIM and IC card requirements	3.0.1	Apr-99	T3	Günter Maringer
TS	21.133	Security Threats and Requirements	3.1.0	Apr-99	S3	Per Christoffersson
TR	21.9	3GPP Working methods	3.2.0	Apr-99	S	
TR	21.904	UE Capability Requirements (UCR)	1.1.0	Mar-00	T2	Craig Bishop
TR	21.905	3G Vocabulary	1.0.0	Dec-99	S1	Michele Zarri
TR	21.91	Multi-mode UE issues	1.3.2	Mar-00	T2	Sofi Persson
TR	21.978	Feasibility Technical Report – CAMEL Control of VoIP Services	2.1.0		N2A	David Smith
TS	22.001	Principles of Telecommunication Services Supported by a GSM Public Land Mobile Network(PLMN)	3.1.1		S1	
TS	22.002	Bearer Services Supported by a GSM PLMN	3.2.0	Oct-99	S1	
TS	22.003	Teleservices Supported by a GSM Public Land Mobile Network (PLMN)	3.1.0		S1	
TS	22.004	General on Supplementary Services	3.1.0	Oct-99	S1	
TS	22.011	Service accessibility	3.1.0	Oct-99	S1	
TS	22.016	International Mobile Equipment Identities (IMEI)	3.1.0	Oct-99	S1	
TS	22.022	Personalisation of GSM ME Mobile functionality specification - Stage 1	3.0.1	Oct-99	S3	
TS	22.024	Description of Charge Advice Information (CAI)	3.0.1	Oct-99	S1	
TS	22.03	Man-Machine Interface (MMI) of the Mobile Station (MS)	3.2.0	Oct-99	S1	
TS	22.034	High Speed Circuit Switched Data (HSCSD) - Stage 1	3.1.0	Oct-99	S1	
TS	22.038	SIM application toolkit (SAT); Stage 1	3.0.0	Oct-99	S1	
TS	22.041	Operator Determined Call Barring	3.1.0	Oct-99	S1	
TS	22.042	Network Identity and Time Zone (NITZ), stage 1	3.1.0	Oct-99	S1	
TS	22.043	Support of Localised Service Area (SoLSA) - Stage 1	3.0.1	Oct-99	S1	
TS	22.053	Tandem Free Operation of speech codecs; Stage 1 service description	0.1.1	Tbd	S4	
TS	22.057	Mobile Station Application Execution Environment (MExE); Stage 1	3.0.1	Oct-99	S1	
TS	22.06	General Packet Radio Service (GPRS); Stage 1	3.2.0	Oct-99	S1	
TS	22.066	Support of Mobile Number Portability (MNP); Stage 1	3.0.1	Oct-99	S1	
TS	22.067	enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage	3.0.1	Oct-99	S1	

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TS	22.071	Location Services (LCS); Stage 1 (T1P1)	3.2.0	Oct-99	S1	
TS	22.072	Call Deflection (CD); Stage 1	3.0.1	Oct-99	S1	
TS	22.078	CAMEL; Stage 1	3.2.0	Oct-99	S1	
TS	22.079	Support of Optimal Routing; Stage 1	3.0.1	Oct-99	S1	
TS	22.081	Line Identification Supplementary Services; Stage 1	3.1.0	Oct-99	S1	
TS	22.082	Call Forwarding (CF) Supplementary Services; Stage 1	3.0.1	Oct-99	S1	
TS	22.083	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services; Stage 1	3.0.1	Oct-99	S1	
TS	22.084	MultiParty (MPTY) Supplementary Service; Stage 1	3.0.1	Oct-99	S1	
TS	22.085	Closed User Group (CUG) Supplementary Services; Stage 1	3.1.0	Oct-99	S1	
TS	22.086	Advice of Charge (AoC) Supplementary Services; Stage 1	3.1.0	Oct-99	S1	
TS	22.087	User-to-user signalling (UUS); Stage 1	3.0.1	Oct-99	S1	
TS	22.088	Call Barring (CB) Supplementary Services; Stage 1	3.0.1	Oct-99	S1	
TS	22.09	Unstructured Supplementary Service Data (USSD); Stage 1	3.0.1	Oct-99	S1	
TS	22.091	Explicit Call Transfer (ECT) Supplementary Service; Stage 1	3.0.1	Oct-99	S1	
TS	22.093	Call Completion to Busy Subscriber (CCBS); Stage 1	3.0.1	Oct-99	S1	
TS	22.094	Follow Me Stage 1	3.1.0	Dec-99	S1	
TS	22.096	Calling Name Presentation (CNAP); Stage 1 (T1P1)	3.0.1	Oct-99	S1	
TS	22.097	Multiple Subscriber Profile (MSP); Stage 1	3.1.0	Oct-99	S1	
TS	22.1	UMTS Phase 1	3.5.0	Apr-99	S1	Jean-Paul Gallaire
TS	22.101	UMTS Service principles	3.8.0	Apr-99	S1	Paul Dwyer
TS	22.105	Services & Service capabilities	3.7.0	Apr-99	S1	Wayne Ashwell
TS	22.115	Service Aspects Charging and billing	3.2.0	Apr-99	S1	Emanuele Montegrosso
TS	22.121	Provision of Services in UMTS - The Virtual Home Environment	3.1.0	Jun-99	S1	Jumoke Ogunbekum
TS	22.129	Handover Requirements between UMTS and GSM or other Radio Systems	3.2.0	Apr-99	S1	David Cooper
TS	22.135	Multicall Stage1	3.1.0	Dec-99	S1	Tommi Kokkola
TS	22.14	Multimedia Messaging Service Stage 1	3.0.0	Dec-99	S1	Gunnar Schmidt
TR	22.907	Terminal concepts	3.1.3	Apr-99	S1	Mika Tolvanen
TR	22.924	Charging and accounting mechanisms	3.1.1	Apr-99		Emanuele Montegrosso
TR	22.925	Quality of service and network performance	3.1.1	Apr-99		Olle Eriksson
TR	22.945	Study of provision of fax service in GSM and UMTS	3.0.0	Oct-99	T4/S MG03	Eric Colban
TR	22.96	Mobile multimedia services	3.0.1	Apr-99	S1	Thomas Ahnberg
TR	22.971	Automatic establishment of roaming relationships	3.1.1	Apr-99	S1	Emanuele

						Montegrosso
TR	22.972	Multimedia	0.0.0	Dec-99	S1	
TR	22.975	Advanced addressing	3.1.0	Apr-99	S1	Stephan Kleier
TS	23.002	Network Architecture	3.2.0	Oct-99	S2	Alain Sultan
TS	23.003	Numbering, Addressing and Identification	3.3.0	Apr-99	N2B	
TS	23.007	Restoration procedures	3.2.0	Apr-99	N2B	
TS	23.008	Organisation of subscriber data	3.2.0	Apr-99	N2B	
TS	23.009	Handover procedures	3.1.0	Apr-99	N1	
TS	23.011	Technical Realization of Supplementary Services - General Aspects	3.0.0	Apr-99	NSS	
TS	23.012	Location registration procedures	3.1.0	Apr-99	N2B	
TS	23.014	Support of Dual Tone Multi Frequency (DTMF) signalling	3.1.0	Apr-99	N1	
TS	23.015	Technical realisation of Operator Determined Barring (ODB)	3.1.0	Apr-99	N2B	Ian Park
TS	23.016	Subscriber data management - Stage 2	3.3.0	Apr-99	N2B	
TS	23.018	Basic Call Handling - Technical realisation	3.3.0	Apr-99	N2B	Ian Park
TS	23.032	Universal Geographical Area Description (GAD)	3.0.0	Apr-99	S2	
TS	23.034	High Speed Circuit Switched Data (HSCSD) - Stage 2	3.1.1	Apr-99	N1	Ian Harris
TS	23.038	Alphabets & Language	3.3.0	Jun-99	T2	Ian Harris
TS	23.039	Interface Protocols for the Connection of Short Message Service Centers (SMSCs) to Short Message Entities (SMEs)	3.1.0	Jun-99	T2	Ian Harris
TS	23.04	Technical realisation of SMS Point to Point	3.3.0	Jun-99	T2	Ian Harris
TS	23.041	Technical Realization of Short Message Service Cell Broadcast (SMSCB)	3.1.0	Oct-99	T2	
TS	23.042	Compression algorithm for SMS	3.1.0	Jun-99	T2	Ian Harris
TS	23.054	Shared Interworking Functions - Stage 2	3.0.0	Apr-99	N3	Tommy Rostö
TS	23.057	Mobile Station Application Execution Environment (MExE)	3.0.0	Dec-99	T2	Mark Cataldo
TS	23.06	General Packet Radio Service (GPRS) Service description; Stage 2	3.2.1	Mar-00	S2	Hans-Petter Naper
TS	23.066	Support of GSM Mobile Number Portability (MNP) stage 2	3.1.0	Oct-99	N2B	
TS	23.067	Enhanced Multi-Level Precedence and Preemption Service (EMLPP) - Stage 2	3.0.0	Apr-99	NSS	
TS	23.072	Call Deflection Supplementary Service - Stage 2	3.2.0	Apr-99	NSS	
TS	23.073	Support of Localised Service Area (SoLSA) - Stage 2	3.0.0	Oct-99	NSS	
TS	23.078	CAMEL Stage 2	3.3.0	Apr-99	N2A	Christian Hohmann/ Sumio Miyagawa
TS	23.079	Support of Optical Routeing - Phase 1 - Stage 2	3.3.0	Apr-99	N2B	Ian Park
TS	23.081	Line Identification Supplementary Services - Stage 2	3.0.0	Apr-99	NSS	
TS	23.082	Call Forwarding (CF) Supplementary Services - Stage 2	3.1.0	Apr-99	NSS	
TS	23.083	Call Waiting (CW) and Call Hold (HOLD) Supplementary Service - Stage 2	3.1.0	Apr-99	NSS	

TS	23.084	MultiParty (MPTY) Supplementary Service - Stage 2	3.1.0	Apr-99	NSS	
TS	23.085	Closed User Group (CUG) Supplementary Service - Stage 2	3.0.0	Apr-99	NSS	
TS	23.086	Advice of Charge (AoC) Supplementary Service - Stage 2	3.0.0	Apr-99	NSS	
TS	23.087	User-to-User Signalling (UUS) - Stage 2	3.0.0	Apr-99	NSS	
TS	23.088	Call Barring (CB) Supplementary Service - Stage 2	3.0.0	Apr-99	NSS	
TS	23.09	Unstructured Supplementary Service Data (USSD) - Stage 2	3.1.0	Apr-99	NSS	
TS	23.091	Explicit Call Transfer (ECT) Supplementary Service - Stage 2	3.1.0	Apr-99	NSS	
TS	23.093	Call Completion to Busy Subscriber (CCBS) - Stage 2	3.1.0	Apr-99	NSS	
TS	23.094	Follow Me Stage 2	3.0.0	Dec-99	CN	
TS	23.096	Name Identification Supplementary Service - Stage 2	3.0.0	Apr-99	NSS	
TS	23.097	Multiple Subscriber Profile (MSP); Stage 2	3.1.0	Oct-99	NSS	
TS	23.101	General UMTS Architecture	3.0.1	Jun-99	S2	Magnus Olsson
TS	23.107	Quality of Service, Concept and Architecture	3.1.0	Oct-99	S2	Marc Greis
TS	23.108	Mobile Radio Interface Layer 3 specification Core Network Protocols stage 2 (structured procedures)	3.1.0	Jun-99	N1	
TS	23.11	UMTS Access Stratum Services and Functions	3.3.0	Mar-00	S2	Oscar Lopez – Torres
TS	23.116	Super Charger - Stage 2	1.0.0	Dec-99	N2B	Nicholas Alen
TS	23.119	Gateway Location Register (GLR) - Stage2	1.0.0	Mar-00	N2B	Masahiro Sawada
TS	23.121	Architecture Requirements for release 99	3.2.0	Jun-99	S2	Liz Daniel
TS	23.122	Non Access Stratum functions related to Mobile Station (MS) in idle mode	3.1.0	Apr-99	N1	
TS	23.127	Virtual Home Environment / Open Service Architecture	1.1.0	Mar-00	S2	Rob Schmersel
TS	23.14	Multimedia Messaging Service (MMS) Functional description-Stage 2	1.0.0	Mar-00	T2	Gunnar Schmidt
TS	23.146	Technical realisation of facsimile Group 3 service- non-transparent	1.0.0	Mar-00	N3	Junichuro Hagiwara
TS	23.153	Out of Band Transcoder Control - Stage 2	1.0.0	Dec-99	N2B	
TS	23.171	Functional stage 2 description of location services in UMTS	1.1.0	Mar-00	S2	Jan Kåll
TR	23.814	Separating RR and MM specific parts of the MS Classmark	3.1.0	Dec-99	N1	F Yokota
TR	23.821	Architecture Requirements for release 2000	0.0.0	Jun-00	S2	Christer Lind
TR	23.908	Technical report on Pre-Paging	3.0.0	Jun-99	N2B	
TR	23.909	Technical report on the Gateway Location Register	3.0.0	Jun-99	N2B	
TR	23.91	Circuit Switched Data Bearer Services	3.0.0	Mar-00	N3	Achim Braun / Erik Colban
TR	23.911	Technical report on Out-of-band transcoder control	3.0.0	Oct-99	N2	
TR	23.912	Technical report on Super-Charger	3.0.0	Oct-99	N2	Ian Sharp
TR	23.913	Technical report on Turbo-Charger	1.0.0	Jun-00	N1	Sonia Doshi
TR	23.922	Architecture for an All IP network	3.0.0	Dec-99	S2	Elisabeth Hubbard

TR	23.923	Combined GSM and Mobile IP mobility handling in UMTS IP CN	3.0.0	Dec-99	S2	Elisabeth Hubbard
TR	23.925	UMTS Core network based ATM transport	0.2.0	Dec-99	S2	Adel Rouz
TR	23.927	VHE, Open Service Architecture	0.1.0	Dec-99	S1	
TR	23.93	Iu Principles	3.0.0	Jun-99	S2	
TR	23.972	Multimedia Telephony	0.0.3	Dec-99	N1	Timo Kauhanen
TS	24.007	Mobile Radio Interface Signalling Layer 3 - General Aspects	3.2.0	Oct-99	N1	
TS	24.008	Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3	3.2.1	Apr-99	N1	
TS	24.01	Mobile Radio Interface Layer 3 - Supplementary Services Specification - General Aspects	3.0.0	Apr-99	NSS	
TS	24.011	Point-to-Point (PP) Short Message Service (SMS) Support on Mobile Radio Interface	3.1.0	Oct-99	N1/T2	
TS	24.012	Short Message Service Cell Broadcast (SMSCB) Support on the Mobile Radio Interface	3.0.0	Oct-99	N2B/T2	
TS	24.022	Radio Link Protocol (RLP) for Data and Telematic Services on the (MS-BSS) Interface and the Base Station System - Mobile-services Switching Centre (BSS-MSC) Interface	3.2.0	Apr-99	N3	Norbert Klehn
TS	24.065	General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN) ;Subnetwork Dependent Convergence Protocol (SNDCP)	3.1.0		N1	
TS	24.067	Enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 3	3.0.0	Apr-99	NSS	
TS	24.072	Call Deflection Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.08	Mobile radio Layer 3 Supplementary Service specification - Formats and coding	3.1.0	Apr-99	NSS	
TS	24.081	Line Identification Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.082	Call Forwarding Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.083	Call Waiting (CW) and Call Hold (HOLD) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.084	MultiParty (MPTY) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.085	Closed User Group (CUG) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.086	Advice of Charge (AoC) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.087	User-to-User Signalling (UUS) - Stage 3	3.0.0	Apr-99	NSS	
TS	24.088	Call Barring (CB) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.09	Unstructured Supplementary Service Data (USSD) - Stage 3	3.0.0	Apr-99	NSS	
TS	24.091	Explicit Call Transfer (ECT) Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	
TS	24.093	Call Completion to Busy Subscriber (CCBS) - Stage 3	3.0.0	Apr-99	NSS	
TS	24.096	Name Identification Supplementary Service - Stage 3	3.0.0	Apr-99	NSS	

TS	25.101	UE Radio transmission and reception (FDD)	3.1.0	Oct-99	R4	Edgar Fernandes
TS	25.102	UE Radio transmission and reception (TDD)	3.1.0	Oct-99	R4	Meik Kottkamp
TS	25.103	RF parameters in support of RRM	2.0.0	Dec-99	R4	Daniele Franceschini
TS	25.104	UTRA (BS) FDD; Radio transmission and reception	3.1.0	Oct-99	R4	Johan Sköld
TS	25.105	UTRA (BS) TDD: Radio transmission and reception	3.1.0	Oct-99	R4	Meik Kottkamp
TS	25.113	Base station EMC	3.0.0	Dec-99	R4	Esa Barck
TS	25.123	RF parameters in support of RRM (TDD)	3.0.0	Dec-99	R4	Daniele Franceschini
TS	25.133	RF parameters in support of RRM (FDD)	3.0.0	Dec-99	R4	Daniele Franceschini
TS	25.141	Base station conformance testing (FDD)	3.0.0	Dec-99	R4	Takaharu Nakamura
TS	25.142	Base station conformance testing (TDD)	3.0.0	Dec-99	R4	Juergen Meyer
TS	25.201	Physical layer -General Description	3.0.1	Oct-99	R1	Antti Toskala
TS	25.211	Physical channels and mapping of transport channels onto physical channels (FDD)	3.1.1	Oct-99	R1	Andreas Wilde
TS	25.212	Multiplexing and channel coding (FDD)	3.1.1	Oct-99	R1	Yoshinori Tanaka
TS	25.213	Spreading and modulation (FDD)	3.1.1	Oct-99	R1	Peter Chambers
TS	25.214	FDD; physical layer procedures	3.1.1	Oct-99	R1	Takehiro Nakamura
TS	25.215	Physical layer; Measurements (FDD)	3.1.1	Oct-99	R1	
TS	25.221	Physical channels and mapping of transport channels onto physical channels (TDD)	3.1.1	Oct-99	R1	Katsuhiko Hiramatsu
TS	25.222	Multiplexing and channel coding (TDD)	3.1.1	Oct-99	R1	Jussi Kahtava
TS	25.223	Spreading and modulation (TDD)	3.1.1	Oct-99	R1	Kenji Ito
TS	25.224	TDD; physical layer procedures	3.1.1	Oct-99	R1	Stefan Oestreich
TS	25.225	Physical layer; Measurements (TDD)	3.1.1	Oct-99	R1	
TS	25.301	Radio Interface Protocol Architecture	3.3.0	Apr-99	R2	Wolfgang Granzow
TS	25.302	Services provided by the physical layer	3.3.0	Oct-99	R2	Nathalie Ting
TS	25.303	Interlayer procedures in connected mode	3.2.0	Jun-99	R2	Mikko J.Rinne
TS	25.304	UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode	3.1.0	Oct-99	R2	Tommi Leivonen
TS	25.305	Stage 2 Functional Specification of Location Services in UTRAN (LCS)	3.0.0	Mar-00	R2	David G Steer
TS	25.321	MAC Protocol Specification	3.2.0	Jun-99	R2	Armin Sitte
TS	25.322	RLC Protocol Specification	3.1.2	Oct-99	R2	Daniele Franceschini
TS	25.323	Packet Data Convergence Protocol (PDCP) protocol	3.0.0	Dec-99	R2	Martin Hans
TS	25.324	Radio Interface for Broadcast/Multicast Services	3.0.0	Dec-99	R2	Peter Krischan
TS	25.331	RRC Protocol Specification	3.1.0	Oct-99	R2	Richard Burbridge
TS	25.401	UTRAN Overall Description	3.1.0	Oct-99	R3	Jean-Marie Calmel
TS	25.402	Synchronisation in UTRAN Stage 2	3.0.0	Dec-99	R3	Flavio Piolini

TS	25.41	UTRAN Iu Interface: General Aspects and Principles	3.1.0	Oct-99	R3	Richard Townend
TS	25.411	UTRAN Iu interface Layer 1	3.1.0	Jun-99	R3	Achim Brandt
TS	25.412	UTRAN Iu interface signalling transport	3.2.0	Jun-99	R3	Kiran Thakare
TS	25.413	UTRAN Iu interface RANAP signalling	3.0.0	Dec-99	R3	Jyrki Jussila
TS	25.414	UTRAN Iu interface data transport & transport signalling	3.2.0	Jun-99	R3	David Comstock
TS	25.415	UTRAN Iu interface user plane protocols	3.1.0	Oct-99	R3	Alain Maupin
TS	25.419	UTRAN Iu interface: Cell broadcast protocols between SMS-CBC and RNC	0.0.0	Mar-00	R3	carolyn Taylor
TS	25.42	UTRAN Iur Interface: General Aspects and Principles	3.0.0	Dec-99	R3	Kiran Thakare
TS	25.421	UTRAN Iur interface Layer 1	3.0.0	Jun-99	R3	Achim Brandt
TS	25.422	UTRAN Iur interface signalling transport	3.2.0	Jun-99	R3	Kiran Thakare
TS	25.423	UTRAN Iur interface RNSAP signalling	3.0.0	Dec-99	R3	Göran Rune
TS	25.424	UTRAN Iur interface data transport & transport signalling for CCH data streams	3.1.0	Jun-99	R3	Nicolas Drevon
TS	25.425	UTRAN Iur interface user plane protocols for CCH data streams	3.0.0	Oct-99	R3	Nicolas Drevon
TS	25.426	UTRAN Iur and Iub interface data transport & transport signalling for DCH data streams	3.1.0	Jun-99	R3	Sami Kekki
TS	25.427	UTRAN Iur and Iub interface user plane protocols for DCH data streams	3.1.0	Oct-99	R3	Fabio Longoni
TS	25.43	UTRAN Iub Interface: General Aspects and Principles	3.0.0	Dec-99	R3	Mick Wilson
TS	25.431	UTRAN Iub interface Layer 1	3.0.0	Jun-99	R3	Achim Brandt
TS	25.432	UTRAN Iub interface signalling transport	3.1.0	Jun-99	R3	Mick Wilson
TS	25.433	UTRAN Iub interface NBAP signalling	3.0.0	Dec-99	R3	Nobutaka Ishikawa
TS	25.434	UTRAN Iub interface data transport & transport signalling for CCH data streams	3.1.0	Jun-99	R3	Magnus Aldén
TS	25.435	UTRAN Iub interface user plane protocols for CCH data streams	3.1.0	Oct-99	R3	Jean-Marie Calmel
TS	25.442	UTRAN Implementation Specific O&M Transport	3.0.0	Oct-99	R3	Stephan Recker
TR	25.831	Study Items for future release	0.0.2	Dec-99	R3	Nicolas Drevon
TR	25.832	Manifestations of Handover and SRNS relocation	3.0.0	Oct-99	R3	Richard Townend
TR	25.833	Physical layer items not for inclusion in Release 99	1.0.0		R1	
TR	25.921	Guidelines and principles for protocol description and error handling	3.0.0	Dec-99	R2	Jean Dumazy
TR	25.922	Radio Resource Management Strategies	3.0.0	Dec-99	R2	Nicola Pio Magnani
TR	25.924	Opportunity Driven Multiple Access (ODMA)	1.0.0	Dec-99	R2	Alan Law
TR	25.925	Radio Interface for Broadcast/Multicast Services	3.0.0	Dec-99	R2	Peter Krischan
TR	25.926	UE Radio Access capabilities definition	1.0.0	Dec-99	R2	Johan Lundsjo
TR	25.931	UTRAN Functions, examples on signalling procedures	1.2.2	Dec-99	R3	Enrico Scarrone
TR	25.941	Document structure	3.1.0	Dec-99	R4	Tadao Takami
TR	25.942	RF system scenarios	2.1.1	Dec-99	R4	Nadia Benabdallah

TR	25.943	Deployment aspects	0.0.1	Dec-99	R4	Johan Skold
TR	25.944	Channel coding and multiplexing examples	1.0.0	Dec-99	R1	
TR	25.99	Vocabulary for UTRAN	3.0.0	Oct-99	R4	Peter Okrah
TS	26.071	AMR speech Codec; General description	3.0.1	Jun-99	S4	Erik Ekudden
TS	26.073	AMR speech Codec; C-source code	3.0.0	Dec-99	S4	Erik Ekudden
TS	26.074	AMR speech Codec; Test sequences	3.0.0	Dec-99	S4	Erik Ekudden
TS	26.075	AMR speech Codec; Performance Charaterization of the GSM AMR Speech Codec	1.0.0		S4	
TS	26.09	AMR speech Codec; Transcoding Functions	3.1.0	Jun-99	S4	Erik Ekudden
TS	26.091	AMR speech Codec; Error concealment of lost frames	3.1.0	Jun-99	S4	Erik Ekudden
TS	26.092	AMR speech Codec; comfort noise for AMR Speech Traffic Channels	3.0.1	Jun-99	S4	Erik Ekudden
TS	26.093	AMR speech Codec; Source Controlled Rate operation	3.1.0	Jun-99	S4	Erik Ekudden
TS	26.094	AMR Speech Codec; Voice Activity Detector for AMR Speech Traffic Channels	3.0.0	Oct-99	S4	
TS	26.101	AMR speech Codec; Frame Structure	3.0.0	Dec-99	S4	Jari Hagqvist
TS	26.102	AMR speech Codec; Interface to Iu and Uu	3.0.0	Dec-99	S4	Wiliam Navarro
TS	26.103	Codec lists	3.0.0	Dec-99	S4	Karl Hellwig
TS	26.104	AMR speech Codec; Floating point C-Code	0.1.0	Mar-00	S4	
TS	26.11	Codec for Circuit switched Multimedia Telephony Service; General Description	3.0.1	Jun-99	S4	Barry Aronson
TS	26.111	Codec for Circuit switched Multimedia Telephony Service; Modifications to H.324	3.1.0	Jun-99	S4	Barry Aronson
TS	26.112	Codec(s) for Circuit Switched Multimedia Telephony Service ;Call Set-up Requirements	1.1.0	Jun-99	S4	
TS	26.131	Narrow Band (3.1kHz) Speech & Video Telephony Terminal Acoustic Characteristics	3.0.0	Dec-99	S4	Ian Goetz
TS	26.132	Narrow Band (3.1kHz) Speech & Video Telephony Terminal Acoustic Test Specification.	0.0.0	Jun-00	S4	Ian Goetz
TR	26.911	Codec for Circuit switched Multimedia Telephony Service;Terminal Implementor’s Guide	3.2.0	Jun-99	S4	Petri Haavisto
TR	26.912	Codec for Circuit switched Multimedia Telephony Service;Quantitative performance evaluation of H.324 Annex C over 3G	1.0.0	Mar-00	S4	Olle Franceschi
TR	26.913	Quantitative performance evaluation of real-time packet switched multimedia services over 3G	0.0.1	Dec-00	S4	Harri Honko
TR	26.915	Transmission planning aspects of the services in 3G PLMN System	0.0.0	Mar-00	S4	Ian Goetz
TR	26.92	Architectural Model for the 3G Transcoders	0.1.1		S4	William Navarro

TR	26.975	AMR speech Codec; Performance Characterization of the GSM AMR Speech Codec	1.0.0	Mar-00	S4	Erik Ekudden
TS	27.001	General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)	3.3.0	Apr-99	N3	Eric Colban
TS	27.002	Terminal Adaptation Functions (TAF) for services using Asynchronous bearer capabilities	3.2.0	Apr-99	N3	Eric Colban
TS	27.003	Terminal Adaptation Functions (TAF) for services using Synchronous bearer capabilities	3.2.0	Apr-99	N3	Eric Colban
TS	27.005	Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)	3.1.0	Jun-99	T2	Ian Harris
TS	27.007	AT command set for 3G User Equipment (UE)	3.3.0	Jun-99	T2	Lars Novak
TS	27.01	Terminal Equipment to User Equipment (TE-UE) multiplexer protocol User Equipment (UE)	3.2.0	Jun-99	T2	Lars Novak
TS	27.06	GPRS Mobile Stations supporting GPRS	3.3.0	Apr-99	N3	Graham Heaton
TS	27.103	Wide Area Network Synchronisation	3.0.0	Oct-99	T2	Rob Lockhart
TR	27.901	Report on Terminal Interfaces - An Overview	3.0.0	Dec-99	T2	Thomas Rex
TR	27.903	Discussion of Synchronisation Standards	3.0.0	Oct-99	T2	Rob Lockhart
TS	29.002	Mobile Application Part (MAP)	3.3.0	Apr-99	N2B	
TS	29.007	General requirements on Interworking between the PLMN and the ISDN or PSTN	3.3.0	Apr-99	N3	Norbert Klehn
TS	29.01	Information Element Mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MCS) Signalling Procedures and the Mobile Application Part (MAP)	3.1.0	Oct-99	N2B	
TS	29.011	Signalling Interworking for Supplementary Services	3.0.0	Apr-99	NSS	
TS	29.013	Signalling interworking between ISDN supplementary services Application Service Element (ASE) and Mobile Application Part (MAP) protocols	3.0.0	Oct-99	NSS	
TS	29.016	Serving GPRS Support Mode SGSN - Visitors Location Register (VLR); Gs Interface Network Service Specification	3.0.0	Apr-99	N1	
TS	29.018	Serving GPRS Support Mode SGSN - Visitors Location Register (VLR); Gs Interface Layer 3 Specification	3.2.0	Apr-99	N1	
TS	29.06	GPRS Tunnelling protocol (GPT) across the Gn and Gp interface	3.3.0	Apr-99	N2B	Tom Eric Ask
TS	29.061	General Packet Radio Service (GPRS); Interworking between the Public Land Mobile Network (PLMN) supporting GPRS and Packet	3.2.0	Apr-99	N3	Graham Heaton
TS	29.078	CAMEL; Stage 3	3.2.0	Oct-99	N2A	Jan Ellsberger
TS	29.119	GPRS Tunnelling Protocol (GTP) specification for Gateway Location Register (GLR)	1.0.0	Mar-00	N2B	

TS	29.12	Mobile Application Part (MAP) specification for Gateway Location Register (GLR)- stage 3	1.0.0	Mar-00	N2B	
TR	30.504	Work Plan and Study Items - RAN WG4	2.2.0	Dec-99	R4	Masaaki Iwasa
TR	30.531	Work Plan and Study Items - RAN WG3	0.5.0	Dec-99	R3	Björn Ehrstedt
TR	30.801	Overall Project Plan	1.0.0	Dec-99	S2	Alain Sultan
TR	30.802	Project plan on Bearer Services and QoS	1.0.0	Dec-99	S2	Oscar Lopez-Torres
TR	30.804	Project plan on GSM/UMTS Interoperation and Mobility Management	1.0.0	Dec-99	S2	François Courau
TR	30.806	Project plan on Location based services	1.0.0	Dec-99	S2	Jan Kåll
TR	30.808	Project plan on Packet Architecture and Circuit Architecture	1.0.0	Dec-99	S2	Ulrich Dropmann
TR	30.81	Project plan on Security	1.0.0	Dec-99	S2	Chris Pudney
TR	30.812	Project plan on Services and Service platforms	1.0.0	Dec-99	S2	Rob Schmersel
TS	31.101	UICC / Terminal Interface; Physical and Logical Characteristics	3.0.0	Dec-99	T3	Rune Lindholm /Peter Vestergaard
TS	31.102	Characteristics of the USIM Application	3.0.0	Dec-99	T3	M. Kobayashi and Ch. Heim
TS	31.11	Numbering system for telecommunication IC card applications	3.0.0	Dec-99	T3	Christian Dietrich
TS	31.111	USIM Application Toolkit (USAT)	1.0.0	Mar-00	T3	Kristian Woodsend
TS	31.12	Terminal tests for the UICC Interface	0.0.0	Jun-00	T3	Klaus Vedder
TS	31.121	UICC Test Specification	0.0.0	Jun-00	T3	Klaus Vedder
TS	32.005	GSM charging CS domain	3.0.0	Jun-00	S5	Michael Sanders
TS	32.015	GSM charging PS domain	3.0.0	Jun-00	S5	Michael Sanders
TS	32.101	3G Telecom Management principles and high level requirements	3.0.0	Mar-00	S5	Michael Truss
TS	32.102	3G Telecom Management architecture	3.0.0	Mar-00	S5	Tommy Berggren
TS	32.104	3G Performance Management	3.0.0	Mar-00	S5	Karl-Heinz Nenner
TS	32.105	3G charging call event data	0.0.1	Jun-00	S5	Michael Sanders
TS	32.106	3G Configuration Management	1.1.0	Mar-00	S5	Thomas Tovinger
TS	32.111	3G Fault Management	1.1.0	Jun-00	S5	Gaetano Cicchitto
TS	33.102	Security Architecture	3.3.1	Mar-00	S3	Bart Vinck
TS	33.103	Security Integration Guidelines	3.1.0	Oct-99	S3	Bart Vinck
TS	33.105	Cryptographic Algorithm requirements	3.2.0	Jun-99	S3	Bart Vinck
TS	33.106	Lawful interception requirements	3.1.0	Jun-00	S3	Bart Vinck
TS	33.107	Lawful interception architecture and functions	3.0.0	Dec-99	S3	
TS	33.12	Security Objectives and Principles	3.0.0	Apr-99	S3	Tim Wright
TR	33.9	Guide to 3G security	1.0.0	Dec-99	S3	
TR	33.901	Criteria for cryptographic Algorithm design process	3.0.0	Jun-99	S3	Vinck Bart
TR	33.902	Formal Analysis of the 3G Authentication Protocol with Modified Sequence	3.1.0	Oct-99	S3	

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TS	34.108	Common Test Environments for User Equipment (UE) Conformance Testing	0.0.1	Jun-00	T1	Lidia Salmeron
TS	34.109	Logical Test Interface (TDD and FDD)	1.0.3	Jun-00	T1	Leif Mattisson
TS	34.121	Terminal Conformance Specification, Radio Transmission and Reception (FDD)	1.5.0	Mar-00	T1	Kenji Higuchi
TS	34.122	Terminal Conformance Specification, Radio Transmission and Reception (TDD)	1.0.0	Jun-00	T1	Thomas Maucksch
TS	34.123-1	UE Conformance Specification, Part 1 – Conformance specification	1.0.0	Jun-00	T1	Lidia Salmeron
TS	34.123-2	UE Conformance Specification, Part 2 – ICS	1.0.0	Jun-00	T1	Shicheng Hu
TS	34.123-3	UE Conformance Specification, Part 3 – Abstract Test suites	0.0.0	Mar-01	T1	Shicheng Hu
TS	34.124	Electro-Magnetic Compatibility (EMC) for Terminal equipment - stage 1	1.2.2	Mar-00	T1	Ole Soerensen
TR	34.907	Report on electrical safety requirements and regulations	3.0.0	Oct-99	T2	Eiji Iimori
TR	34.91	Conformance Test specifications – Relevant for Regulatory use	0.0.1	Mar-01	T1	Bjarke Nielsen
TR	34.925	Specific Absorption Rate (SAR) requirements and regulations in different regions	3.0.0	Jun-99	T2	Sven Johnsson