



Cellular Networking Perspectives

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An update on the standards being produced by the 3GPP Technical Specification Group that provides much of its high level coordination and technical direction.

Reorganization of Surveillance Standards

A reorganization of standards for lawfully authorized electronic surveillance (LAES) has been initiated by TIA committee TR-45, although it may not yet be complete. The joint *ad hoc* group between TIA TR-45 and ATIS T1P1 will have its work capped with the rebalot of J-STD-025 Revision B. Specifically, Revision C, originally planned to address new packet data issues, will not proceed in that group.

Instead, the work will be divided amongst two subcommittees, TR-45.6, with initial responsibility for the packet data interface (e.g. PDSN) and TR-45.2, which will have initial responsibility for surveillance on the 'All IP' network (IMS/MMD).

One of the most controversial issues in the past has been decisions about whether or not a particular capability belonged in J-STD-025. The new standards to be developed by TR-45.2 and TR-45.6 will avoid consideration of legal issues. Capabilities may be inserted even if they are clearly outside the scope of specific laws, such as CALEA, as long as they are not illegal under all circumstances. This erases the former distinction between J-STD-025 work which required conformance to CALEA (controversial because not every party agreed about what was within the scope of the law and what wasn't) and with the Additional Law Enforcement Capabilities, planned for PN-3-0125, but for which little work had been done.

The TIA is considering having another group, weighted more with legal expertise, take the technical standards and decide which aspects are covered under various laws.

This might also make TIA law enforcement standards more palatable for other countries as, by not considering US legal requirements, their output becomes more generic.

ATIS T1P1 (now the *Wireless Technologies and Systems Committee*) may be interested in continuing joint work on surveillance standards. The 'All IP' network that is being standardized by 3GPP2 and the TIA is being adapted from one developed by 3GPP, so joint work between TIA TR-45.2 and ATIS T1P1 would make sense.

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ia450 – New Technology, Old Association, New Name

The **International 450 Association** is a new name for the NMT Association, formerly the NMT MoU. The new name reflects the new mandate to promote a migration to cdma2000 digital, as well as continuing to maintain its analog NMT systems.

NMT (Nordic Mobile Telephony) was once the most widespread analog technology except for AMPS/TACS. The writing is on the wall for all analog cellular systems, although they still provide valuable rural coverage, and it will be years before they are completely shut down.

In September 2003, IA450 was launched with an announcement that, having compared GSM and cdma2000, it had decided that the adaptation of CDMA to this band was the best approach.

Since then, a number of systems have been launched, particularly in Eastern Europe. These systems provide 2.5G and 3G features, with quite large cells, due to the lower frequency band.

This new technology will have many challenges. Roaming between cdma 450 systems using the TIA-41 MAP is likely to be the first goal of many operators after establishing their national networks. These systems often exist where GSM is dominant, so that cross-technology roaming would be desirable to the cdma 450 carrier. It is not clear whether GSM operators will eye this favorably, however. Roaming with CDMA systems in other frequency bands will be easier technically, but these systems tend to be in markets in Asia and the Americas, far away from cdma450 systems, although there definitely is some overlap.

New Leadership for TIA TR-45.2

The new chair of TIA TR-45.2 is David Crowe, editor of this newsletter. The vice-chair is Lew Milton of Motorola. Fittingly, perhaps, for a US election year, it took 3 ballots to break a tie between David Crowe and Betsy Kidwell of Lucent for this position.

This subcommittee of TR-45 is responsible for standardization of the analog, CDMA and TDMA core network protocols, including the adaptation of specifications produced by 3GPP2 TSG-X. TR-45.2 is also responsible for standards for three US government mandates:

- E911 – Emergency services. Standardized in J-STD-034 and J-STD-036, jointly with ATIS.
- LNP – Local Number Portability for wireless systems.
- WPS – Wireless Priority Service, a voluntary program, not a true mandate.

ATIS T1's Vanishing Act

In August, 2004, ATIS announced the termination of the historic name “T1” as an identifier for its standards committees. The new names are:

Table 1: T1 Renaming

Old Name	New ATIS Committee Name
T1A1	Network Performance, Reliability and Quality of Service
T1E1	Network Interface, Power, and Protection
T1M1	Telecom Management and Operations
T1P1	Wireless Technologies and Systems
T1S1	Packet Technologies and Systems
	Protocol Interworking
T1X1	Optical Transport and Synchronization

3GPP TSG SA: Service & System Aspects

3GPP TSG SA (Service and System Aspects) defines the overall architecture and service capabilities of systems based on 3GPP specifications. It is therefore responsible for coordination between TSGs and, in this role, reports to the **Project Coordination Group (PCG)**. This update covers TSG SA meeting #24.

It was agreed, at TSG SA#24, to produce an 800 series TR for *Early Implementation* to describe and provide guidance on features that are possible for early implementation.

3GPP TSG SA WG1 (Service)

3GPP TSG SA Working Group 1 (SA1 – Service) defines the services and features for 3G. SA1 develops Stage 1 descriptions containing high level requirements for services and service capabilities. It also defines the framework for services and identifies technical and operational issues to meet charging, accounting and marketing requirements.

SA1 has seven sub-working groups:

1. Messaging.
2. Location Service (LCS).
3. IP Multimedia Service (IMS), the ‘All IP’ network.
4. Wireless LAN interworking (I-WLAN).
5. Generic User Profile (GUP).
6. Priority Services.
7. Multimedia Broadcast and Multicast Service (MBMS).

Messaging SWG 1. This group addressed a number of proposed enhancements for MMS, including:

- Handling of Private Addressing Schemes.
- Presentation of MMS by the USAT.
- IMS Messaging Terminology.
- Harmonisation of Short Codes for Services based on SMS, MMS and Unstructured Supplementary Service Data (USSD).

All agreements were included in a new version of **TS 22.140**.

WLAN SWG 4. This is the busiest group. It discussed network and PLMN selection for 3GPP-WLAN interworking, corrected the existing specification (**TS 22.234**) and added support for:

- Multiple simultaneous connections to Visited PLMNs.
- UE connection to I-WLAN.
- Definition of a WLAN Charging Identifier.

Priority Services SWG 6. Produced a new version of *Priority Service Feasibility* (**TR 22.950**) based on two CRs and a new version of the *Priority Service Guide* (**TR 22.952**).

MBMS SWG 7. This SWG agreed to incorporate CRs for the *UE Joining Time* and decided, based on a liaison from GERAN 2 that RAN and core network resources should not be released for notifications but only for MBMS content.

Table 2: 3GPP TSG SA Working Group 1 (Service) Specification Update

Document	Title	Status
tbd	Network Protection against Virus-Infected Mobiles	New Work Items
tbd	All-IP Network Feasibility Study	
tbd	Adding Media to Circuit Switch Calls and IP Multimedia Sessions	
tbd	Multi-System Mobile Station	
tbd	Network Selection Enhancements	
tbd	A GNSS concept to extend A-GPS to include GALILEO	
TR 21.905	Vocabulary for 3GPP Specifications	Rel 6 being revised.
TS 22.004	General on Supplementary Services	Rel 4 and Rel 5 being revised.
TS 22.011	Service Accessibility	Rel 6 being revised. Rel 7 available.
TS 22.071	Location Services (LCS); Service Description; Stage 1	Rel 7 available.
TS 22.101	Service Aspects; Service Principles	Rel 6 being revised. Rel 7 available.
TS 22.228	Service Requirements for the Internet Protocol (IP) Multimedia Core Network Subsystem; Stage 1	Rel 6 being revised.
TS 22.234	Requirements on 3GPP System to Wireless Local Area Network (WLAN) Interworking	

3GPP TSG SA WG2 (Architecture)

3GPP TSG SA Working Group 2 (SA2 – Architecture) develops the Stage 2 for the 3GPP network. Based on service requirements from SA1, it identifies the main functions and entities of the network, defines their function and how they are linked to each other and outlines the information they exchange. Stage 2 descriptions from SA2 are used by other groups when defining the precise format of messages in Stage 3. The only exception is that Stage 2 for the Radio Access Network is under the control of TSG RAN.

Some of the topics discussed in working group meetings held from April 19 – 23, 2004 and May 17 – 21, 2004 are:

- Location Services. These discussions resulted in corrections to the interpretation of location in the Rel 99 Stage 2 (**TS 23.271**) and operation of the Location Request Procedure.
- MBMS.
- WLAN Interworking.
- Charging.
- Network Sharing.
- Circuit Switched Voice and Video.
- Access Class Barring.
- Migration from IPv4 to IPv6.

The following changes were adopted for Rel 5:

- Early IMS implementation – TS 23.221 was clarified to indicate that while IMS was designed to be used exclusively with IPv6, early IMS implementations and deployments may use IPv4.
- Location Services – TS 23.271 was clarified in the areas of the non-dialable callback number and the Network Induced Location Request (NI-LR) using Location-based Routing procedure.

The following changes were adopted for Rel 6:

- Architecture – Changes were inserted into TS 23.002 to introduce WLAN functional elements, reference points and presence service configuration. Corrections were made to the scope of the UE to Application Server (Ut) reference point. The Gateway Mobile Location Centre (GMLC) and GMLC (Lr reference point) were also added.
- General Packet Radio Service (GPRS) Stage 2 – TS 23.060 had its Specification Description Language (SDL) diagram corrected and a clarification that IMEISV shall be sent over the Gs interface for Automatic Device Detection (ADD) was added.
- Virtual Home Environment (VHE)/Open Service Access (OSA) – The OSA high level abstraction interface was added to TS 23.127. SA2 also proposed, via a liaison statement, to transfer responsibility for this specification to CN5.
- IP Flow Based Bearer Level Charging – Charging rules, Time-based charging, Policy functions, Message flows and general correction and clarifications were inserted into TS 23.125. This completes the overall architecture for *Flow Based Charging*.
- Presence – Annex B of TS 23.141 was moved into the normative section. It was clarified that the choice of reference points (type of protocols) supported by the Presence Network Agent was an implementation option.
- Architecture Requirements – The Packet Data Protocol (PDP) context handling and Early IMS implementation with IPv4 were clarified in TS 23.221.
- IP Multimedia Subsystem (IMS) Phase 2 – Changes to TS 23.228 included Session-based messaging additions and corrections, definition of Private User Identity, Identity Sharing, Registration information and events, and Generalization of IPv4-IPv4 interworking. This work is expected to be completed by September 2004.
- Wireless LAN (WLAN) Interworking – Corrections and clarifications for SMS over IP, WLAN User Equipment Classes, Routing Enforcement and Charging were made in TS 23.234.

- Generic User Profile (GUP) Stage 2 – Changes made to TS 23.240 included the clarification that the GUP server is in the home network and that the Rp interface is within a single operator's network. An example, *Clarification on GUP authentication failure*, was added and requirements for component location management were added.
- MBMS Stage 2 – Changes were made in TS 23.246 to add: a session duration parameter when starting a broadcast session; support for both bearer and application level charging; and notification of an incoming call while in an MBMS session.
- Location Service – Changes were inserted into TS 23.271 to cover E112 support and clarify the handling of emergency calls with a SIM/UIM in the phone. Clarifications were also made to information storage, the Visited GMLC address and the privacy check procedure. Enhancements were made to the Mobile Originate Location Request (MO-LR).
- Network Sharing – Changes were made to TR 23.851. to clarify Gs interface usage and the Core Network operator ID usage in the MSC/SGSN. Further details were added to describe both the RAN centric solution and the CN centric solution for routing. This TR will be converted into the new TS 23.251, along with some additional information.
- Push-to-Talk over Cellular (PoC) – The TR is expected to be completed by SA#26 (December 2004) if the OMA PoC Architecture Document stabilizes soon.
- Quality of Service (QoS) – Changes were made in TS 23.207 for the new authorization rejection procedure, application function capabilities and a clarification that Gq, the Policy Decision Function – Application Server interface, is within a domain for IMS.
- PS domain and IMS changes to support IMS emergency calls will not be included in Rel 6.

Rel 7 work is still in the early stages.

3GPP TSG SA WG3 (Security)

3GPP TSG SA Working Group 3 (SA3 – Security) defines the security of the 3GPP system, analyzing potential security threats, considering the new threats introduced by IP and setting the security requirements for the overall 3GPP system.

Between TSG SA #23 and TSG SA#24, the working group held a meeting about *Lawful Intercept* on April 14-16th 2004 and a full working group meeting on May 10-14th 2004.

Many changes were inserted into the Lawful Intercept specifications (TS 33.106, TS 33.107, and TS 33.108) for both Rel 5 and Rel 6 versions.

Table 3: 3GPP TSG SA Working Group 2 (Architecture) Specification Update

Document	Title	Status
tbd	Update WID for Interworking Aspects and Migration Scenarios for IPv4-based IMS Implementation	Updated the expected output of the WI to include a 900 (external) series TR, instead of 800 (internal).
tbd	Update WID on Circuit Switched Video and Voice Service	Update the WI description
tbd	Update WID on 3GPP Access Class Barring and Overload Protection	
tbd	WID for End-to-End QoS Enhancement	New Work Item
TS 03.71	Location Service (LCS); Functional Description; Stage 2	Rel 98 and Rel 99 being revised.
TS 23.060	GPRS; Stage 2	Rel 6 being revised.
TS 23.125	Overall High Level Functionality and Architecture Impacts of Flow Based Charging	
TS 23.127	Virtual Home Environment / Open Service Access	
TS 23.207	End-to-End QoS Concept and Architecture	
TS 23.221	Architectural Requirements	Rel 5, Rel 6 being revised.
TS 23.228	IP Multimedia Subsystem (IMS); Stage 2	Rel 6 being revised.
TS 23.234	3GPP System to Wireless Local Area Network (WLAN) Interworking; System Description	
TS 23.246	Multimedia Broadcast/Multicast Service (MBMS); Architecture and Functional Description	
TS 23.251	Network Sharing; Architecture and Functional Description	Rel 6 available.
TS 23.271	Functional Stage 2 Description of LCS	Rel 6 being revised.
TR 23.801	Potential Mechanisms for CS Domain Video and Voice Improvements	Rel 6 under development.
TR 23.851	Network Sharing; Architecture and Functional Description	Rel 6 being revised.
TR 23.898	Access Class Barring and Overload Protection	Rel 6 being developed.
TR 23.976	Push Architecture	Rel 6 being revised.
TR 23.917	Dynamic Policy Control Enhancements for End-to-End QoS	Replaced by TS 23.207 .
TR 23.977	Bandwidth and Resource Saving and Speech Enhancements for Circuit-Switch (CS) Networks	Rel 6 available.
TR 23.979	3GPP Enabler for OMA PoC Service; Stage 2	Rel 6 being developed.
TR 23.981	Interworking Aspects and Migration Scenarios for IPv4-based IMS Implementation	Rel 6 available.

Two change requests were inserted into the IMS Security specification (**TS 33.203**) to correct IMS confidentiality protection and SIP Privacy mechanism when IMS is interworking with a non-IMS network.

3GPP TSG SA WG4 (Codec)

3GPP TSG SA Working Group 4 (SA4 – Codec) specifies speech, audio, video, and multimedia codecs for both the circuit-switched and packet-switched environments. This includes quality evaluation, end-to-end performance, and interoperability aspects with existing mobile and fixed networks.

Four SA4 working group meetings were held between SA #23 and SA #24.

Debates have raged over the audio codec selection. Many companies want to have a default codec defined to reduce implementation costs and guarantee interoperability. Others want to have one default *encoder* and *two* default *decoders*. There are pros and cons to both of the candidate codecs, Enhanced aacPlus and Extended AMR-WB, depending on the bit-rate and content type. SA4 is seeking guidance from TSG SA and other working groups (e.g. T2 and SA1 on use cases).

Table 4: 3GPP TSG SA Working Group 3 (Security) Specification Update

Document	Title	Status
TS 33.102	3G Security Security Architecture	Rel 5 and Rel 6 being revised.
TS 33.105	Cryptographic Algorithm Requirements	Rel 4 being revised.
TS 33.106	Lawful Interception Requirements	Rel 6 being revised.
TS 33.107	Lawful Interception Architecture and Function	
TS 33.108	Handover Interface for Lawful Interception	
TS 33.141	Presence Service; Security	Rel 6 available.
TS 33.220	Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture	Rel 6 being revised.
TS 33.222	Generic Authentication Architecture (GAA); Access to Network Application functions using HTTPS	Rel 6 available.
TS 33.234	3G Security; Wireless Local Area Network (WLAN) Interworking Security	Rel 6 being revised.
TS 33.310	Network Domain Security (NDS); Authentication Framework (AF)	
TR 33.919	Generic Authentication Architecture (GAA); System Description	Rel 6 under development.

Table 5: 3GPP TSG SA4 (Codec) Specification Update

Document	Title	Status
TS 26.234	Transparent End-to-End Packet Switched Streaming Service (PSS); Protocols and Codec	Rel 6 available.
TS 26.235	Packet Switched Conversational Multimedia Applications; Default Codecs	Rel 6 being revised.
TS 26.236	Packet Switched Conversational Multimedia Applications; Transport Protocols	Rel 5 being revised. Rel 6 available.
TS 26.243	ANSI-C Code for the Fixed-Point Distributed Speech Recognition Extended Advanced Front-End	Rel 6 available.
TS 26.245	Transparent End-to-End Packet Switched Streaming Service (PSS); Timed Text Format	
TS 26.246	Transparent End-to-End Packet Switched Streaming Service (PSS); 3GPP SMIL Language Profile	
TS 26.273	Fixed-Point ANSI-C Code for the Extended Adaptive Multi-Rate Wideband (AMR-WB+) Codec	Rel 6 under development.
TS 26.290	Audio Codec Processing Functions; Extended Adaptive Multi-Rate-Wideband (AMR-WB+) Codec	
TS 26.304	Floating-Point ANSI-C Code for the Extended Adaptive Multi-Rate Wideband (AMR-WB+) Codec	
TS 26.401	General Audio Codec Audio Processing Functions; Enhanced aacPlus General Audio Codec; General Description	
TS 26.402	Additional Decoder Tools	
TS 26.403	Encoder Specification; Advanced Audio Coding (AAC) Part	
TS 26.404	Encoder Specification; Spectral Band Replication (SBR) Part	
TS 26.405	Encoder Specification; Parametric Stereo Part	
TS 36.410	ANSI-C Code	
TR 26.935	Packet Switched Conversational Multimedia Applications; Performance Characterisation of Default Codecs	

3GPP TSG SA WG5 (Telecom Management)

3GPP TSG SA Working Group 5 (SA5 – Telecom Management) defines the requirements and framework for management of the UMTS 3G system, including the architecture descriptions of the telecommunication management network (TMN). It coordinates with other TSGs for portions of this work done by them.

SA5 held two meetings between SA #23 and SA #24, from March 29th – April 2nd 2004 and from May 10th – 14th 2004.

SA5 expects to complete both the Subscription Management TS and Charging Management TS by September 2004. It plans to complete work on OAM&P by December 2004.

Table 6: 3GPP TSG SA5 (Telecom Management) Specification Update

Document	Title	Status
TS 32.101	Telecommunication Management; Principles and High-Level Requirements	Rel 6 available.
TS 32.102	3G Telecom Management Architecture	Rel 6 being revised.
TS 32.104	3G Performance Management	Rel 99 being revised.
TS 32.111-2	Fault Management; Part 4: Alarm Integration Reference Point (IRP): Information Service	Rel 4 being revised.
TS 32.152	Integration Reference Point (IRP) Information Service (IS) Unified Modelling Language (UML) Repertoire	Rel 6 being revised.
TS 32.171	Subscription Management (SuM) Resource Integration Reference Point (IRP); Requirements	Rel 6 available.
TS 32.205	Charging Management; Charging Data Description for the Circuit Switched (CS) Domain	Rel 5 being revised.
TS 32.215	3G Charging Data Description for the Packet Switched (PS) Domain	Rel 4 and Rel 5 being revised.
TS 32.322	Telecommunication Management; Test Management Integration Reference Point (IRP); Information Service	Rel 5 being revised.
TS 32.323	CORBA Solution Set	
TS 32.324	CMIP Solution Set	
TS 32.342	File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)	Rel 6 available.
TS 32.352	Communication Surveillance (CS) Integration Reference Point (IRP): Information Service (IS)	
TS 32.353	Common Objected Request Broker Architecture (CORBA) Solution Set (SS)	
TS 32.363	Entry Point (EP) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)	Rel 6 being revised.
TS 32.401	Performance Management (PM); Concept and Requirements	Rel 4, Rel 5 and Rel 6 being revised.
TS 32.403	Performance Measurements - UMTS and Combined UMTS/GSM	
TS 32.412	Integration Reference Point (IRP): Information Service	Rel 6 being revised.
TS 32.413	Common Object Request Broker Architecture (CORBA) Solution Set (SS)	
TS 32.431	Requirements	Rel 6 under development.
TS 32.615	Configuration Management (CM); Bulk CM Integration Reference Point (IRP): eXtensible Markup Language (XML) File Format Definition	Rel 4 and Rel 5 being revised.

Table 6: 3GPP TSG SA5 (Telecom Management) Specification Update - cont.

Document	Title	Status
TS 32.623	Generic Network Resources: Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)	Rel 5 and Rel 6 being revised.
TS 32.624	Common Management Information Protocol	Rel 4 and Rel 5 being revised. Rel 6 available.
TS 32.642	UTRAN Network Resources Integration Reference Point (IRP): Network Resource Model (NRM)	Rel 5 and Rel 6 being revised.
TS 32.643	Common Object Request Broker Architecture (CORBA) Solution Set	
TS 32.661	Kernel CM: Requirements	Rel 6 being revised.
TS 32.662	Kernel CM Information Service (IS)	
TS 32.663	Kernel CM Integration Reference Point (IRP): CORBA Solution Set	Rel 5 and Rel 6 being revised.
TS 32.741	Signalling Transport Network (STN) Interface Network Resource Model (NRM) Integration Reference Point (IRP): Requirements	Rel 6 under development.
TS 32.742	Information Service (IS)	
TR 32.804	Telecommunication Management; Control of Remote Electrical Tilting (RET) Antennas; Requirements	

Meetings

TSG SA held its most recent plenary on June 7th – 9th 2004 in Seoul, Korea. Future plenaries will be held:

- September 13th – 15th in Palm Springs, Arizona.
- December 13th – 16th in Athens, Greece.
- March 14th – 17th 2005 in Tokyo, Japan.
- June 6th – 9th 2005 in Québec, Canada.
- September 26th – 29th 2005 in Tallin, Estonia.
- December 4th – 7th 2005 in location tbd.
- March 13th – 16th 2006 in China.
- June 5th – 8th 2006.
- September 25th – 28th 2006.
- December 4th – 7th 2006.

2004 SA1 meetings. October 11th – 15th 2004 in Sophia Antipolis, France and January 17th – 21th 2005 in South Africa.

2004 SA2 meetings. October 11th – 15th 2004 in Sophia Antipolis, France; November 15th – 19th 2004 in Seoul, Korea; January 26th – February 2nd 2005 in Europe; April 4th – 8th 2005 in China; May 9th – 13th 2005

in Europe; June 27th – July 1st 2005 in USA; September 5th – 9th 2005 in Sophia Antipolis, France and November 7th – 11th 2005 in Asia.

2004 SA3 meetings: October 5th – 8th 2004 Malta (SA3-LI); October 12th – 14th 2004 USA; November 23th – 26th 2004 Shenzhen, China.

2004 SA4 meetings. November 22th – 26th 2004 Helsinki, Finland.

2004 SA5 meetings. September 27th – October 1st 2004 Sophia Antipolis, France; November 15th – 19th 2004 Sanya, China; January 24th – 28th 2005 Europe; March 14th – 18th 2005; May 9th – 13th 2005; June 27th – July 1st 2005; August 29th – Sept. 2nd 2005; November 7th – 11th 2005.

A complete list of 3GPP meetings is at:

www.3gpp.org/Meetings/meetings.htm#calendar