

Cellular Networking Perspectives

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Vol. 11, No. 1 January, 2003

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The US FCC is planning to privatize the assignment of US SID codes. This number identifies a wireless system, or portion of a wireless system, to mobiles.

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3GPP is well into the development of its next major release - Release 6. This article provides a list of the major new or enhanced features.

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TSG T standardizes many aspects of 3GPP terminals (with the major exception of the radio interfaces, which are standardized by TSG RAN and TSG GERAN).

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TIA TR-45.6 maintains 2G packet data standards (CDPD) and, in conjunction with 3GPP2 TSG-P, develops packet data standards for cdma2000 systems.

3GPP2 TSG-N and TSG-P are Merging

The rumored merger of 3GPP2 TSG-N (Core Network) and TSG-P (Packet Data) is a fact. By early in 2003, a new TSG will have risen from the ashes of the old. This change was approved at a 3GPP2 Steering Committee/Organizational Partners meeting in Sapporo, Japan in October. Several meetings since then have refined plans for the merger, which will probably be consummated in February, 2002.

The need to merge these TSGs came from the planned merger of wireless telephony and packet data. By using an IP-based packet data core network, the distinction between 'Core Network' and 'Packet Data' is erased.

FCC Considers Privatization of US SID Assignment

The FCC is considering the privatization of SID Assignment. The SID (System Identifier) is broadcast by every AMPS, N-AMPS, TDMA and CDMA system – it is used to identify the system. It is an important identifier that has many uses, including allowing mobiles to quickly scan available systems and determine which would be the best for it to access. It also allows the source of a signal to be identified in cases of interference.

The SID plays a similar, and equally critical, identification role in billing processes, particularly those using CIBER records.

The FCC has received letters from nine organizations interested in performing this function and hopes to have completed the transition to a private administrator by March, 2003.

To 3GPP Release 6... and Beyond!

3GPP Release 6 is the next major step in the evolution of UMTS/Wideband CDMA standards. It advances the All-IP core network originally defined by Rel 5.

The working assumptions for 3GPP features are that the development of Stage 1 (feature description), Stage 2 (network information flow) and Stage 3 (protocol specification) each will take an average of six months, leading to an average 18 month development cycle.

A better estimate of the Release 6 completion date will be produced by TSG#19 (March 2003) after more precise analysis on the progress of the features and after considering feedback from all 3GPP working groups.

See **Table 1** for a list of all Rel 6 features and their status.

3GPP TSG T (Terminal) Update

3GPP TSG Terminals (TSG T) specifies terminal interfaces (logical and physical), capabilities (such as execution environments), performance and testing. It does not cover the radio aspects of terminals (see TSG RAN), nor codecs for speech and multimedia (see SA4).

TSG T working groups are gradually shifting the application standardization, and some personnel, to the Open Mobile Alliance (www.openmobilealliance.org). This is causing some delegates to express concerns on how effective the work in T2 will be in the future.

Next Issue: February 4th, 2003

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Cellular Networking Perspectives (issn 1195-3233) is published monthly by Cellular Networking Perspectives Ltd., 2636 Toronto Crescent NW, Calgary AB, T2N 3W1, Canada. Phone: 1-800-633-5514 (+1-403-274-4749) Fax: +1-403-289-6658 Email: cnp-sales@cnp-wireless.com Web: www.cnp-wireless.com Subscriptions: CDN\$350 in Canada (incl. GST), US\$350 in the USA and US\$400 elsewhere. Payment by cheque, bank transfer, American Express, Diners Club, MasterCard or Visa. Delivery: Email or 1st class mail. Back Issues: Single issues are \$40 in the US and Canada and \$45 elsewhere, or in bulk at reduced rates. Discounts: Educational and small businesses: 25% off any order. Copies: Each subscriber is licensed to make up to 10 copies of each issue or back issue. Please call for rates to allow more.

Table 1: 3GPP Release 6 Features

Feature Group	Features	Status
Evolution of Transport in the Universal Terrestrial Radio Access Network (UTRAN)		No work assigned to this feature; its status will be re-evaluated in next TSG meeting.
Evolution of the Transport in the Core Network (CN)		New features will be added to existing specifications: TS 23.205, TS 29.205, TS 23.153, and TS 29.007. The target completion date is TSG#20 (June 2003).
Release 6 Improvements to the Radio Interface	Improvement of Inter-frequency and Inter-system Measurement (RAN WG1)	Completion date delayed to June 2003.
	Multiple Input Multiple Output Antennas (MIMO) (RAN WG1)	Regular joint discussions with 3GPP2 on channel modeling are occurring. Proposed completion date September 2003.
	Improving Receiver Performance Requirements for the FDD User Equipment (RAN WG4)	Scope and completion date has being revised, since new work areas have been identified. New completion date is September 2003.
	FDD Base Station Classification (RAN WG4)	Completed
	Terminal Power Saving Feature (RAN WG2)	No progress
Location Based Service (LCS) Enhancements		Work is progressing in various 3GPP working groups.
Emergency Call Enhancements	Emergency Calls for Internet Protocol (IP) and Packet Switch (PS) Calls with Universal Subscriber Identity Module (USIM).	Stage 1 Requirements were provided by SA WG1 in TS 22.228. Stage 2 architecture from SA WG2 is targeted for April 2003. Stage 3 protocol from TSG CN WG1 is targeted for September 2003. There is no support for emergency calls in IP Multimedia Subsystem (IMS)/Packet Switch Rel 5. Development of this capability in Rel 6 is dependant on SA WG2 input.
Priority Service		Stage 1 requirements in TR 22.950 are being developed.
Charging Management		New work items on charging were approved at TSG #18, and work will begin early in 2003.
Security Enhancements	Network Domain Security (NDS) Feasibility Study in TR 33.910	Nearing completion.
	Mobile Application Protocol (MAP) Application Layer Security	Work is in progress, and the first draft of TS 29.2002 is scheduled to be available in March, 2003.
IP Multimedia Subsystem (IMS) Phase 2		Stage 1, 2 and 3 work is ongoing mainly at TSG SA WG1 and SA WG2 and CN WG1 and CN WG3.
Push Services		Work continues on Stage 1 document TS 22.174. The Stage 2 work item description was approved in December 2002, and work will begin early in 2003 in SA WG2.
Presence Service		Stage 1 was approved at TSG SA#13 (September 2001) for inclusion in TS 22.141. Stage 2 was published at TSG SA#17 (September 2002) in TS 23.141. Stage 3 is progressing in CN WG1. The target completion date is TSG #20 (June 2003). Security aspects are being considered by SA WG3. Work on charging and testing has not yet begun.

Table 1: 3GPP Release 6 Features (continued)

Feature Group	Features	Status
Multimedia Messaging Service (MMS) Enhancements		Work is ongoing.
Mobile Execution Environment (MExE)	MExE Run Time Independent Framework Feasibility Study (TR 22.857)	Completed in December 2002.
	MExE R6 Improvements and Investigation	Nearly complete. If there is no input at TSG T#19 (March 2003), this Work Item will be closed, hence no major new requirements will be allowed.
Operations, Administration, Maintenance & Provisioning (OAM&P)	User Equipment Management (UEM)	Stage 1 and Stage 2 in TS 32.150 has started in SA WG5. Stage 3 in TS 27.150 has not begun in TSG T WG2.
	TS 32.421 Trace Management	Stage 1 approved at TSG SA#18.
	TS 32.422 Trace Control and Configuration Management Enhancements.	About half completed.
	TS 32.423 Trace Data Definition and Management.	About one-third completed.
	GSM Spec 52.008 GSM Subscriber and Equipment Trace.	About half completed.
	Subscription Management	Stage 1 in TS 32.140 is in progress. Stage 2 and Stage 3 will start early in 2003.
Multimedia Broadcast/Multicast Service (MBMS)		Stage 1 was approved at TSG SA#13 (September 2001) in TS 22.146. Stage 2 is ongoing for TS 23.246. Target completion date is TSG #20 (June 2003). Stage 3 work on radio aspects is ongoing, but work has not begun on the core network. Security aspects are being studied by TSG SA WG3.
Speech Recognition and Speech Enabled Services (SES)		Stage 1 was approved at TSG SA#17 (September 2002) for TR 22.977 and TS 22.243. Stage 2 work has not begun, but the completion date is estimated as March 2003. A new SA WG4 work item on a codec to support speech recognition for automated voice services was approved at TSG #18, and work will begin early in 2003
Packet Switched Streaming (PSS)		Modifications of the stage 1 in TS 22.233 is continuing. A new SA WG4 work item for enhancements was approved at TSG #18, and work will begin early in 2003.
Generic User Profile (GUP)		Stage 1 in TS 22.240 is targeted for approval at TSG SA#19 (March 2003). Stage 2 work is progressing with a target completion date of June 2003.
Digital Rights Management (DRM)		Stage 1 for TS 22.242 has been completed. Stages 2 and 3 have been deferred to the Open Mobile Alliance (www.openmobilealliance.org).
Wireless Local Access Network (WLAN) / Universal Mobile Telecommunications System (UMTS) Interworking		Stage 1 was approved at TSG SA#17 (September, 2002) in TR 22.934. A few outstanding issues remain to be addressed. Stage 2 in TR 23.934 and TS 23.234 are targeted for approval at TSG SA#19 (March 2003). WLAN interworking security for TR 33.934 is being developed.

Table 1: 3GPP Release 6 Features (continued)

Feature Group	Features	Status
Network Sharing		Stage 1 in TR 22.951 was approved at TSG SA#18. Stage 2 work will begin early in 2003 by SA WG2.
Quality of Service (QoS) Improvements	Feasibility Study on Dynamic Policy Control Enhancements for End-to-End QoS	Work is ongoing in TR 23.917. Targeted completion date is March 2003.
	Policy-based control of DiffServ	This new work item was approved at TSG #18, and work will begin early in 2003
Open Service Access (OSA) Improvements		Stage 1 for TS 22.127 is being developed. CN WG5 is developing Stage 2 and Stage 3.

T1 – Conformance Testing

TSG T WG1 (Mobile Terminal Conformance Testing) develops User Equipment (terminal) conformance testing specifications based on requirements from other groups such as RAN4 for radio tests, and RAN2 and CN1 for signaling and protocol tests. T1 is organized into two (2) sub-working groups: RF (T1 RF SWG) and Signaling (T1 SIG SWG).

As of the December 2002 TSG T#18, the status of WG1 was:

- 5 new Radio Resource Management (RRM) test cases for TDD were developed.
- Corrections and updates to existing Test Cases were completed.

- The first Tree and Tabular Combined Notation (TTCN) test cases were completed, and T1 published a new TTCN test specification.
- At the next meeting in San Antonio, Texas, USA in February 2003, T1 will hold an election for chair and vice-chair, as well as for these position in its RF SWG.
- T1 SIG SWG chair and vice chair elections are not due for another year.

Table 2: 3GPP TSG T Working Group 1 Specifications

Document	Title	Status
TS 34.108	Common Test Environments for User Equipment (UE) Conformance Testing	R99 and R4 versions being revised.
TS 34.121	Terminal Conformance Specification; Radio transmission and reception (FDD)	
TS 34.122	Terminal Conformance Specification; Radio transmission and reception (TDD)	
TS 34.123-1	Mobile Station (MS) Conformance Specification; Part 1: Protocol Conformance Specification	R5 version being revised.
TS 34.123-2	Part 2: Implementation Conformance Statement (ICS) Pro Forma Specification	
TS 34.123-3	Part 3: Abstract Test Suites (ATs)	R99 version in press.

T2 – Services & Capabilities

3GPP TSG T WG2 (T2) defines the Services and Capabilities to be delivered by 3GPP Terminal Equipment, thus ensuring that terminals will meet 3GPP objectives. It is responsible for terminal-based applications, features and interfaces. This group is organized into three sub-working groups.

- The SWG will now only meet when required. It might even be disbanded.
- The work item for MExE Rel-6 *Improvements and Investigations* will remain open until the next TSG meeting in March 2003, but it will be closed if there is no activity by then.

A User Equipment Management (UEM) Work Item Description was produced, but there was insufficient support from T2 delegates. Companies supporting this project will need to muster more allies, as four supporting companies are required in order to proceed.

T2 SWG1 - MExE. SWG1 – MExE (Mobile Execution Environment) provides a standardized execution environment in the UE and the ability to negotiate capabilities with a MExE service provider, allowing applications to be developed independently of any UE platform. The status of this group's projects is:

- TR 22.857 – *Run Time Independent Framework Feasibility Study* was approved.

T2 SWG2 – UE Interfaces and Capabilities. SWG2 reached unanimous agreement on a Data Description Method (DDM) for the Generic User Profile (GUP).

GUP is the data which is stored and managed by different entities such as the User Equipment (UE), the Home Environment, the Serving Network and the Value Added Service Provider. This data affects the way in which an individual user experiences services.

T2 SWG3 – Messaging. This group is now focussing on MMS (Multimedia Messaging Service):

- It received a liaison from Open Mobile Alliance estimating that public review of Stage 3 work for MMS Rel 5 will begin in Q1'2003.
- The MM [Multi-media] Message Size definition Stage 2 specification in TS23.140 was aligned with SA5 requirements.

Table 3: 3GPP TSG T Working Group 2 Reports and Specifications

Document	Title	Status
tbd	Generic User Profile (GUP) Data Description Method (DDM)	New work item.
TR 22.857	Run Time Independent Framework Feasibility Study	In press.
TS 23.040	Technical Realization of the Short Message Service (SMS)	R5 version being revised.
TS 23.041	Technical Realization of Cell Broadcast Service (CBS)	R99 and R4 versions being revised.
TS 23.057	Mobile Execution Environment (MExE); Functional description; Stage 2	R6 version in press.
TS 23.140	Multimedia Messaging Service (MMS); Functional description; Stage 2	R5 and R6 versions being revised.
TS 27.005	Use of Data Terminal Equipment (DTE)- Data Circuit Terminating Equipment (DCE) Interface for SMS and CBS.	R99 and R4 version being revised.
TS 27.007	AT Command Set for User Equipment (UE)	R99, R4, R5, and R6 versions being revised.

T3 – USIM

3GPP TSG T WG3 is responsible for specifications involving the Subscriber Identity Module (SIM) used by 2G (GSM/GPRS) systems and the USIM (Universal Subscriber Identity Module) which is used by 3G (W-CDMA) systems.

This does not include the security algorithms which are developed by SA WG3. T3 also maintains specifications and associated test cases for the 3G USIM, and its interface with the Mobile Terminal.

At the December 2002 TSG T#18, Jean-Francois Rubon of Gemplus was elected as second vice-chairman.

A User Equipment Management Work Item was approved. This is independent of the work T2 was asked to do but for which there was insufficient commitment.

Table 4: 3GPP TSG T Working Group 3 Specifications

Document	Title	Status
tbd	User Equipment (UE) Management	New work item,
TS 23.048	Security Mechanisms for the (U)SIM Application Toolkit; Stage 2	R5 version being revised.
TS 31.101	UICC-Terminal Interface; Physical and Logical Characteristics	R4, R5, and R6 versions being revised.
TS 31.102	Characteristics of the USIM Application	R99, R5, and R6 versions being revised.
TS 31.103	Characteristics of the ISIM Application	R5 and R6 versions being revised.
TS 31.111	USIM Application Toolkit (USAT)	R99, R4, and R5 versions being revised.
TS 31.112	USIM Application Toolkit (USAT) Interpreter Architecture Description	R5 version being revised.
TS 31.115	Secured Packet Structure for (U)SIM Toolkit Applications	R6 versions being revised.
TS 31.116	Remote APDU Structure for (U)SIM Toolkit Applications	
TS 31.121	UICC-Terminal Interface; USIM Application Test Specification	R99 and R4 versions being revised.
TS 31.122	USIM Conformance Test Specification	R99 version being revised.
TS 43.019	Subscriber Identity Module Application Programming Interface (SIM API) for Java Card; Stage 2	R5 version being revised.
TS 51.011	Mobile Equipment (SIM - ME) Interface	R4 version being revised.
TS 51.014	SIM Application Toolkit	R4 version in press.

Meetings. The TSG T meeting calendar can be accessed at: www.3gpp.org/Meetings/meetings.htm.

TIA TR-45.6 and TSG-P 2G and 3G Wireless Packet Data Standards

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Last published June, 2002

Note: 1. IS- Interim Standard, TSB- Telecommunications Systems Bulletin, P.Sxxxx - 3GPP2 TSG-P Specification, P.Rxxxx - TSG-P Report, PN- Project Number, SP- ANSI Standards Proposal.
2. Bold Type indicates a modification since the previous publication of this information.
3. Published TIA standards can be obtained from the TIA at www.tiaonline.org/standards

CDPD - Cellular Digital Packet Data

Standard	Project	Description	Status
TIA/EIA-732	SP-4033-UG	Revisions to CDPD and Upgrade to ANSI	Published 06/01
IS-732	PN-4033	Cellular Digital Packet Data (CDPD) - multiple parts	Published 12/97 Being rescinded 01/02
TSB-87	PN-4001...	CDPD support services (Directory, Authentication, DNS, Testing, Identifiers, Numbering)	Published 12/97

3G Packet Data

Standard	Project	Description	Status
IS-835	PN-4732	cdma2000 Wireless IP Network Standard	Published 12/00
IS-835-1	PN-4732-1	Addendum to IS-835	Replaced by IS-835-A
IS-835-A	PN-4732-RV1	cdma2000 Wireless IP Network Standard	Published 05/01
IS-835-B	PN-4732-RV2	Supports IPv6, Dynamic Home Agent, QoS and Push Services	Published 09/02
TIA-930	PN-0075	Legacy mobile station domain step 1 for cdma2000 (IP-based call setup)	Ballot 08/02
TSB-115	PN-4286-A	cdma2000 Wireless IP Architecture based on IETF Protocols	Published 12/00

3GPP2 TSG-P Projects (www.3gpp2.org/Public_html/specs/index.cfm#tsgp)

3GPP2	Description	Status
P.R0001	Wireless IP Network Architecture based on IETF Protocols	Published 08/00
P.S0001	Wireless IP Network Standard based on IETF protocols (same as IS-835)	See IS-835
P.S0001-A	Wireless IP Network Standard	Published 08/00
P.S0001-A-1	Addendum to P.S0001-A	Published 01/01
P.S0001-Av3	Wireless IP Network Standard	See IS-835-A
P.S0001-B	Wireless IP Network Standard	See IS-835-B