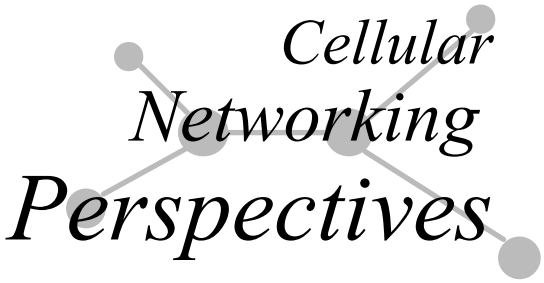
Liaison Report to IFAST Meeting #22



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Destination

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IFAST Meeting #22
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Los Angeles, California

Abstract

A report on activities in the 3GPP2 and TIA standards groups related to international wireless applications.

Recommendation

For the information of IFAST members.

Copyright Statement

Status of 3GPP2 TSG-X Wireless Network Standards

Copyright Statement

TIA/EIA-41 - Intersystem Operations	
Status (Rev. D)	Rev. D published December 1997.
International Support	There are several significant changes included in *TIA/EIA-41* that provide a greater degree of internationalization: i. The use of ITU (CCITT) Signaling System #7 (C7) SCCP and MTP is defined as a transport protocol (along with X.25 and ANSI SS7). ANSI TCAP is recommended for use with all transport protocols. ii. Modifications to the TLDN digits parameter (Digits(Routing)) to make it clear that a full *E.164* (international) directory number is valid as a TLDN. iii. Origination restrictions are defined in a way that is applicable outside the North American Numbering Plan area. iv. The definitions of Digits and RestrictionDigits were clarified to ensure that an international (*E.164*) number could be used to restrict calls to a group of numbers starting with a common prefix or to a single number ("hotline").
Status (Rev. E)	Revision E operations and parameters are nearing publication. Procedures are in ballot review. Stage II scenarios are being prepared for V&V. The separately published standards being included in TIA/EIA-41-E are: • PCS Multi-band – based on IS-41-C (N.S0006 - TSB76) • DCCH (TDMA Digital Control Channel) based on IS-41-C (N.S0007 - IS-730) • Circuit Mode Services – Data based on IS-41-C (N.S0008 - IS-737) • IMSI Support (N.S0009 - IS-751) • CDMA Enhancements (N.S0010 - IS-735) • WNP (Wireless Number Portability) Phase I and Phase II (IS-756-A) • OTASP and OTAPA (N.S0011 - IS-725-A) • CNAP/CNAR (Calling Name Presentation/Restriction) (N.S0012 - IS-764) • Emergency Services (J-STD-034) • WIN (Wireless Intelligent Network) Phase I (N.S0013 - IS-771) • Authentication Enhancements (N.S0014 - IS-778) • Internationalization of ANSI-41 (N.S0016 - IS-807) • ANSI-41 Message Segmentation (N.S0020 - IS-812) Miscellaneous Enhancements Document (N.S0015)

International Support (in Rev. E)	The changes being developed for *TIA/EIA-41-E* that are most relevant to IFAST are: • Support for IMSI (*E.212* International Mobile Subscriber Identity) through the inclusion of IS-751 and its erratum. • Further internationalization through the incorporation of IS-807. • International presentation/origination from wireless phones based on recommendations in IS-875.
Status (Rev. F)	Various parts of Rev. F have been published separately. Integration has not yet been initiated. The parts scheduled to be included are: • Automatic Code Gapping (N.S0023 - IS-786) • Removable User Identity Module (N.S0003 - IS-808) • BTTC (IS-824) • Pre-paid Charging (N.S0018-A - IS-826-A) • Answer Hold (N.S0022 - IS-837) • User Selective Call Forwarding (N.S0021 - IS-838) • MDN Based Message Centers (N.S0024 - IS-841) • Roamer Database Verification (N.S0025-A - IS-847-A) • WIN Phase II (N.S0004 - IS-848) • Emergency Services (N.S0030 - J-STD-036-A) • CDMA Packet Data Services (N.S0029 – IS-880) • Location Services (N.Sxxxx – IS-881) • Location Services – WIN Phase III (N.Sxxxx – IS-843) • International Dialing, Calling Number Identification & Callback, Calling Party Category Identification (N.S0027 – IS-875)
International Support (Rev. F)	Parts of Rev. E and Rev. F that are relevant to international roaming include: • Removable UIM (used mainly by non-North American carriers). • MDN Based Message Centers (necessary when the MIN is an IRM or otherwise does not match the MDN). • Roamer Database Verification. • CDMA Packet Data. • Location Services. • International Dialing and Calling Number ID (IS-875).

N.S0009 / IS-751: IMSI (International Mobile Subscriber Identity) Support	
Status	Published in February 1998.
International Support	Defines the modifications necessary to support IMSI in *TIA/EIA-41 Revision D*. It has been incorporated in *TIA/EIA-41 Revision E.*

N.S0016 / IS-807: Further Internationalization of TIA/EIA-41	
Status	Published in August, 1999. An addendum was published in June, 2000 to support changes in ANSI SS7 global titles. Being incorporated in TIA/EIA-41-E
International Support	TR-45.2 has published IS-807 to further internationalize TIA/EIA-41, including the following items: • Replacement of wording that refers to NANP-specific concepts (e.g. LATA). • Modifications to the PC_SSN parameter usage to ensure that a national SS7 address is not used across a boundary between two signaling domains (e.g. a national boundary). • Modifications to the PC_SSN parameter to support other point code formats (e.g. 14 bit point codes) for TIA/EIA-41 signaling in countries outside the North American Numbering Plan area. • International global titles required to support international routing of TIA/EIA-41 MAP signaling messages (E.164 and E.212). • The standard identifies wireless network elements with E.212 numbers, instead of E.164 (as in GSM). E.212 global titles can then be used to route messages to them. • ANSI and ITU encoding for the SCCP layer for each global title. • Backward compatibility considerations for the international format of the TLDN and other digits transmitted in TIA/EIA-41 parameters. • Clarifies which addresses to use, when several are available. • An addendum modified the SS7 global titles to allow global title routing to function properly on systems that have a mixture of GSM systems, TIA/EIA-41 systems and GSM-to-TIA/EIA-41 gateways.

N.S0017 / TSB29: International Implementation	
Status	Rev. E was published in December, 2002.
International Support	• Lists of SID code ranges assigned to countries have been removed in Revision E. • Lists of SID conflicts assigned to countries have been removed in Revision E. • No longer includes lists of assigned IRM codes. www.ifast.org is referenced instead, as of Revision D. • Information on global titles wasremoved in Revision E, now that IS-807 has been published.

N.S0027 / IS-875: International Number Handling	
Status	PN-4863 has been approved for publication as IS-875. Being incorporated in TIA/EIA-41-E
International Support	Clarifies network and MS support for: • Calling number identification (international format unless caller, home and serving system are all in same country) • Plus code dialing (should be usable even for numbers within current country, with network responsible for removing international indicators when not appropriate) • Storage (international indicator should be preserved in phone) • A recent proposal is to clarify that the use of the "+" code with feature code digits (e.g. *XX+Address Digits) means that the address digits included in the feature code string (if any) are to be treated as international, not the entire string.

GSM Interworking		
Status	Several projects have been completed:	
	J-STD-038 (PN-4857)	TR-46.3. Approved for publication in March, 2001.
	J-STD-038-A	Published in January, 2002. Includes GPRS support.
	J-STD-038-B	Being will be balloted by T1P1. Includes CDMA support.
	IS-868 (PN-4925, N.P0025)	CDMA ANSI-41 network enhancements to support SIM roaming to GSM. Completed.
	PN-4926, N.P0026	Interworking and Interoperability Function (IIF) enhancements to support two-way SIM roaming CDMA ANSI-41 <-> GSM. Completed.
	PN-4927, N.P0027	IIF enhancements for one way SIM roaming from CDMA ANSI-41 to GSM. Completed.
	IS-833	A TR-45.5 standard designed to "define changes to Multi-Carrier (MC) CDMA needed to support operation with a core network that uses a version of the Global System for Mobile Communications (GSM) Mobile Application Part (MAP)". Allows GSM application protocols to operate over a CDMA radio interface. Published in March, 2000.
	Packet Data	Packet data interworking (CDMA/GPRS) is under consideration.
International Support	This does not specifically support international roaming, but in cases where one country uses ANSI-41 and the other uses GSM, it enables both the international issues and technology issues to be solved.	
Other	TIA TR-46.3 is also developing ANSI-41/GSM interworking capabilities, as are the various sub-groups within GGRF, such as GAIT (for TDMA) and G-95 (for CDMA).	

TIA/EIA-124: Call Detail Records	
Status	Revision C published August, 2000. Revision D was published in December 2001. Rev. E is under development.
International Support	Although TIA/EIA-124 can support international identifiers (e.g. IMSI, IMEI) it does not properly support international directory numbers, using an NANP-centric method for indicating non-NANP numbers. Revision C added support for WIN Phase I. Rev. D adds support for WIN Phase II (prepaid).

J-STD-025: Lawfully Authorized Electronic Surveillance	
Status	Rev. 0 published in December 1997 has been elevated to ANSI status. Rev. A published in May 2000. Rev. B is under development. Rev. A is being elevated to ANSI status.
International Support	J-STD-025 (Rev. 0) satisfied the telecom industry, but not US law enforcement. After an FCC ruling, J-STD-025 Rev. A was produced that included most of what law enforcement had asked for. However, the FCC ruling was overturned by the US Court of Appeals and another version is likely to be produced following a pending FCC ruling. Following that, the FCC updated the ruling to include the controversial items, but with more justification. Rev. 0 has been elevated to ANSI status. Rev. A has been published now that the FCC has confirmed most of the controversial 'punch list', items that were temporarily over-turned by a US court ruling. It is being elevated to ANSI status. Revision B (PN-4465-RV1) will support requirements for intercept of packet data communications. A new project has been initiated to study surveillance outside the scope of CALEA legislation.

J-STD-034: Emergency Services Phase I	
Status	Published in December 1997.
International Support	A standard to support Phase I of US FCC requirements for emergency services. It provides both the mobile directory number and cell/sector location (ESRD) to the emergency services system, and also allows callback and reconnect. Although it is based on US requirements, other countries may very well have similar needs.

J-STD-036: Emergency Services Phase II	
Status	Revision 0 published in August, 2000. Revision A was published in June, 2002. An addendum was recently published. Revision B is under development.
International Support	Phase II E911 supports more accurate location determination, based either on network-based positioning or mobile-assisted positioning. An addendum enhanced support for mobile-assisted position for both TDMA (SAMPS) and CDMA. Revision A has enhanced support for CDMA MOPD and has added support for TDMA MAHO for positioning. An FCC order recommended the use of an IRM as a pseudo-callback number for uninitialized phones. This contradicts J-STD-036 and has been opposed by the emergency services community and others. An addendum was recently published. It will provide interim (quick but low accuracy) position for routing and will make the pseudo-callback number recommendation (Annex C) normative.

J-STD-038: ANSI-41/GSM Interworking	
Status	Revision 0 for publication in March, 2001. Revision A was published in January, 2002 and adds GPRS support. Revision B is being balloted by TR-46.
International Support	The TR-46 standard for ANSI-41/GSM interworking. Consists of the following parts: Volume 0: Overview and Network Reference Model. Volume 1: Service Descriptions (e.g. 3-way calling, forwarding, call barring). Volume 2: Information flows (diagrams illustrating how messages flow from ANSI-41 to GSM via the IIF, and vice-versa). Voume 3: Message Mapping (i.e. ANSI-41 message to GSM equivalents and vice-versa).

IS-756/IS-841: Number Portability	
Status	Phase I published as IS-756 in April 1998. Phase II was published as IS-756-A in December 1998. Phase III (MDN-based Message Centers) was published in September, 2000 as IS-841. A minor revision will allow emergency services numbers to be portable. Number pooling may result in more significant revisions. .
International Support	IS-756 contains no specific international support, but other countries may also be implementing number portability, and may be interested in the contents of this document. Phase I supports MSC routing to ported wireline numbers. Phase II supports portable Mobile Directory Numbers using the same method as for wireline systems (LRN - Location Routing Number). This phase will force the *separation of the MIN and Mobile Directory Number (MDN) and requires the establishment of a MIN Assignment Authority.* Phase III supports Message Centers that are based on Mobile Directory Numbers (MDN) and not Mobile Identification Numbers (MIN). It was published as IS-841. The schedule for implementation of Wireless Local Number Portability has been delayed until November, 2002. An erratum has been published to allow emergency services numbers to be portable. This is necessary when '911' translates into a local number. A new revision to support Number Pooling is being developed. It has been noted that the IS-756 assumption that TLDNs are not portable is not valid when pooling is considered.

IS-847: Roamer Database Validation	
Status	IS-847 has been balloted. Revision A has been approved for publication.
International Support	This project allows a HLR to query a serving system to determine whether its roamer agreement table can correctly support its subscribers roaming. A revision is being published to extend this project to other network elements. It has been agreed to extend queries from ranges of 10,000 or fewer numbers (suitable for North American MIN's) to an arbitrary range (suitable for IRM codes, IMSI and directory number ranges outside North America).

IP-Based Networks	
Status	Support for Legacy MS Domain Step-1 has been published as TIA-872 "Legacy MS Domain Support for Circuit Mode IP Transport Call Delivery". The LMSD Step-2 work is being initiated and System Requirements (S.P0092-0 are currently being developed. The 3GPP2 All-IP Core Network Enhancements For Multimedia Domain (MMD) specifications, i.e., PN-4935/X.P0013, is being finalized for publication by December, 2003.
International Support	IP-based signaling could potentially replace SS7. This has some advantages, including: • Lower cost equipment • No international signaling barriers • Higher speed signaling links • One network for voice, user data and signaling. Considerations are: • Transport protocols • Routing (e.g. STP versus IP router) • Address translation (e.g. global title versus DNS) TIA-872 supports connection of the current ('legacy') network to some IP transport facilities (LMSD Step 1). PN-4935/X.P0013 defines a fully IP network to support transport of signaling, voice and various types of user data. This is known as the 'multimedia' domain (MMD or IMS). PN-4935/X.P0013 is based on 3GPP Release 5 IMS specifications, adapted to CDMA2000 requirements.

Mobile Equipment Identifier Issues	
Status	3GPP2 has chosen a 56 bit identifier structure compatible with the GSM IMEI as the future replacement mobile equipment identifier (MEID).
International Support	There is growing concern that 32 bit ESN codes will be exhausted in the next few years, and little desire to migrate to 56 bit replacements. One of the potential solutions is to re-use older ESN codes, as most of the codes assigned to manufacturers in the mid-1980's were never used. Even if duplicate ESN's do occur, no problems arise as long as at least one of the mobiles affected is analog (which is true for virtually all ESN's assigned in the 1980's). A letter has been sent by the TIA to the FCC requesting permission to reuse blocks of ESN codes that were assigned, but for which the likelihood of mobiles still existing is low. The first 14-bit manufacturer codes have been assigned. This will extend the life of the ESN resource. UIM Identifiers are now being assigned for ANSI-41 UIM's. They are very similar to the ESN. The 56-bit identifier compatible with GSM IMEI has been chosen as the 3G MEID. Modifications include the use of hexadecimal digits rather than just decimal digits. . The first digit, if hexadecimal 'A' through 'F' indicates MEID, and if decimal '0' through '9' indicates IMEI. Detailed structure of MEID and requirements are spelled out in S.P0048-A. ANSI-41 support for IMEI is being developed developed in the specification X.P0008, due to be published in January 2004. This includes the ability to obtain it from the MS, and to determine the status of the IMEI from the EIR (Equipment Identity Register). Some radio interface messaging to support MEID is being incorporated in C.S0005-D, due to be published by January 2004.

WIN: Wireless Intelligent Network	
Status	WIN Phase I was published as IS-771 in July, 1999. WIN Phase IIa (Prepaid) was published as IS-826 in September, 2000. WIN Phase IIb (e.g. freephone) was approved for publication as IS-848. WIN Phase III (location services) is under development
International Support	WIN Phase I provided triggers for voice controlled services and incoming call screening. It is being modified to better support global titles (e.g. for international communications). WIN Phase IIa supported prepaid systems that do not require loopback trunks or routing calls through external switches. Enhancements for data and SMS are under development. WIN Phase IIb supports other services that integrate special billing services with call processing (e.g. wireless freephone). WIN Phase III will provide support for commercial location-based services.

WPS: Wireless Priority Service	
Status	Standards development is underway.
International Support	This is a standard being developed according to US government requirements. The service will allow the National Security/Emergency Preparedness (NS/EP) personnel to be granted priority access to voice channels to originate wireless phone calls and receive priority treatment in the inter-exchange network. Identified NS/EP calls also receive priority treatment in the terminating wireless network. The service will be implemented in two phases. The standard will be published as TIA-917.

TIA IS-880; CDMA Packet Data (HLR Impact)	
Status	IS-880 has been published. Enhancements to handle circuit/packet interactions are being considered.
International Support	IS-880 provides HLR_based support for CDMA packet data. The packet data system obtains profile information from the HLR, and uses the location management capabilities to enable the delivery of packet data to the correct system. An enhancement known as CPOP (Circuit Precedence Over Packet) will allow the mobile's packet session to be suspended while an incoming call is processed. This is not needed in mobiles that support concurrent services.

TIA-835; CDMA Packet Data (PDSN, HA, AAA)	
Status	TIA-835/X.P0011 Revision C is nearing publication. This standard defines the interfaces between a PDSN (Packet Data Serving Node), a Home Agent (HA) and the AAA (Authentication, Authorization and Accounting) to support packet data services. It also supports prepaid packet data services.
International Support	There is no explicit support for international roaming, but IP-based networks generally do not see international boundaries as barriers as the protocol does not have national variants.

Relevant Activities of Standards Bodies

3GPP2	
Purpose	Mandated to develop specifications for the 3rd generation evolution of standards based on cdma2000.
Activities	The following TSG's are now meeting: TSG-A — Defines the IOS (Inter-Operability Standard) between the base station equipment and network equipment (e.g. MSC's). Associated with TR-45.4. TSG-C — 3G CDMA systems, including 1XRTT, 1xEV-DO, etc. Associated with TR-45.5. TSG-X — Core Network for CDMA2000. Includes the former TSG–P and TSG–N. TSG-S — Service capabilities, features, and system requirements; high-level architectural issues; PMT responsibilities; security; OAM&P; 3GPP2 Vision; Equipment Numbering; OMA relationships, and coordination between the other TSGs. Partners in this project are: CWTS — Chinese Wireless Telecommunications Standards Group (http://www.cwts.org) TTA — Korea Telecommunications Technology Association (http://www.tta.or.kr) ARIB — Japanese Association of Radio Industries and Businesses (http://www.arib.or.jp) TTC — Japanese Telecommunication Technology Committee (http://www.ttc.or.jp) TIA — North American Telecommunications Industry Association (http://www.tiaonline.org)

TIA TR-45.1 Subcommittee	
Purpose	The development of analog air interface standards, including the "core" analog control channel standard used by dual-mode digital air interface standards. Very little activity is occurring here.
Activities	None.

TIA TR-45.2 Subcommittee	
Purpose	The development of standards related to the network support of cellular and PCS systems based on TIA air interfaces. TR-45.2 now meets for about one day within the TSG on on Core Network standards (TSG-X) meeting week, which is responsible for the specifications of the Core Network part of systems, based on 3GPP2 specifications.
Activities	Described elsewhere in this report.

TIA TR-45.3 Subcommittee	
Purpose	Standardization of TDMA (ANSI-136) digital cellular and PCS radio interfaces. Very little activity is occurring here.
Activities	The TIA/EIA-136 'TDMA' air interface: • is transparent to the SID, so the SID assignments of IFAST comply with TIA/EIA-136. • supports plus-code dialing to accommodate international dialing. • supports all character sets character sets of ISO-8859 for both system originated messages and subscriber originated messages, e.g. Short Messages. • supports fixed and removable User Identification Modules in a manner compatible with GSM 11.14. • The next version of the standard will support IMEI.

3GPP2 TSG-A/TIA TR-45.4 Subcommittee	
Purpose	Standardization of IOS interfaces.
Activities	• Continued standardization of the IOS interface in TIA-2001. • Standardizing IOS support for High Rate Packet Data (HRPD) in TIA -878 and TIA-1878.

3GPP2 TSG-C / TIA TR-45.5 Subcommittee	
Purpose	Standardization of CDMA digital cellular and PCS radio interfaces.
Activities	• • The committee has updated the R-UIM specification (TIA/EIA/IS-820-A) • • the committee has created a new CDMA Card Application Toolkit (TIA-915). This describes the interface between an R-UIM (as a 'Smart Card') for CDMA and the mobile 'shell' (ME). • • E.212 IMSI is fully supported by TSG-C standards (from IS-95 to IS-2000). • • Handoffs to and from other technologies are supported via system redirection. An MS can also be directed to use another technology via service redirection.Extending the signaling to new target technologies is relatively easy. • • CDMA standards also support a global emergency calling key/button, which can be pressed to indicate an emergency call even when the local emergency number is not known by an international roamer. • • CDMA standards comply with radio emission limits and regulations in a number of countries. • • CDMA standards have been adapted to 12 different band classes.

TIA TR-45.6 Subcommittee	
Purpose	Created in 1997 to standardize CDPD cellular digital packet data technology. Now developing 3G packet data standards in conjunction with TSG-X. TR-45.6 generally meets within TSG-X meetings.
Activities	• Has developed IS-835 which defines an IP-based system for packet data services. Revision C is currently nearing publication.

3GPP2 TSG-S	
Purpose	The Services and System Aspects TSG (TSG-S) is responsible for the development of service capability requirements for systems based on 3GPP2 specifications. It is also responsible for high-level architectural issues as required to coordinate service development across the various TSGs. In this role, the Services and System TSG shall track the activities within the various TSGs as required to meet the above service requirements.
Activities	TSG-S currently has five Working Groups and three Ad Hoc Groups to organize its work: Working Group 1: Stage 1 Requirements Working Group 2: Architecture, System Consistency, System Evolution Working Group 3: 3GPP2 Project Management, Process, Release Planning Working Group 4:: 3GPP2 Security Aspects Working Group 5: OAM&P Vision Ad Hoc: Future Directions Numbering Ad Hoc: Mobile Equipment ID (MEID), Other Numbering Issues UIM Ad Hoc: UIM Issues.