

# Cellular Networking Perspectives

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SMS interoperability is spreading in North America. Less than a year after Canada and the US each gained national cross-technology text messaging, subscribers can now text across the border.

*Commercial Location Services, Part I: Introduction.....p. 1*

Commercial location services for CDMA, TDMA and possibly even AMPS, will soon be facilitated by a new standard to support network interconnection for roaming mobiles.

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3GPP TSG SA specifies the overall architecture and service capabilities of systems based on 3GPP specifications (e.g. W-CDMA/UMTS) and is also responsible for cross TSG co-ordination. They are still relatively early in the development phase of Release 6 of their specifications, and enhanced All-IP network.

## 3GPP2 TSG-N and TSG-P are Merging...and the new name is...TSG-X

The new TSG for 3GPP2, formed from the merger of TSG-N and TSG-P, will be called TSG-X. Other suggestions were TSG-CN (same as 3GPP, but breaks the 3GPP2 rule of 1-digit monikers), TSG-O (halfway between N and P) and TSG-B (also halfway between N and P, modulus 26). TSG-X started as only a temporary name, but then stuck, when the 3GPP2 Steering Committee adopted it at a January, 2003 meeting. The "X" symbolizes networks – core networks.

## Canada – US Text Messaging

In 2002, Canadian wireless carriers finally provided inter-carrier text messaging (SMS), regardless of the technology being used (TDMA, CDMA or GSM). Many large US carriers soon followed suit. On January 23, 2003, the CTIA ([www.wow-com.com](http://www.wow-com.com)) and the CWTA ([cwta.ca](http://cwta.ca)) announced that cross-border, cross-technology, mobile-to-mobile SMS transmission is now possible.

To test this out, readers may wish to send a message to the editor at his cellphone number: 403-861-2225. The first 10 to do so will win one of our classic golf-shirts, made of recycled cotton and with rare, but environmentally friendly, Tagua palm nut buttons. Include your name, shirt size (M, L, XL) and address in the message, if possible.

## Commercial Location Services, Part I: Introduction

3GPP2 TSG-N and TIA TR-45.2 have nearly completed a network standard to support commercial location services, based on Assisted GPS positioning or on pure network techniques, such as TDOA (Time Difference of Arrival).

Network-based positioning techniques use sophisticated triangulation algorithms, based on measurements from multiple monitoring stations to estimate the position of a mobile.

Assisted GPS uses a GPS receiver within a cellular phone, with the assistance of data and computational support from within the network to calculate position. Generally, the mobile will not determine its position, but it will provide just enough information back to the network to allow the calculation of its current position. The necessary communication between the network and the mobile is defined in TIA IS-801. See our **August, 2000** issue for more details on this standard.

Network support is required, in the case of commercial positioning, to allow roaming. An application may, for example, query a mobile's home system to obtain its location. Signaling is obviously required to contact the serving system, initiate positioning and return the data to the application.

The standard being developed for this purpose is currently most commonly known by its TIA project number, PN-4747. It will be published by the TIA as IS-881. The 3GPP2 project number is N.P0013.

This new standard used J-STD-036, which provides network support for positioning for emergency services calls (e.g. 911), as a starting point. Commercial positioning has some additional challenges, particularly the need to query the home system to obtain position from a mobile, no matter which system is currently serving it.

## Glossary

For any terms you are unfamiliar with, please consult:

[www.cnp-wireless.com/glossary.html](http://www.cnp-wireless.com/glossary.html)

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**Figure 1: PN-4747 (IS-881) Commercial Location Services Information Flow**

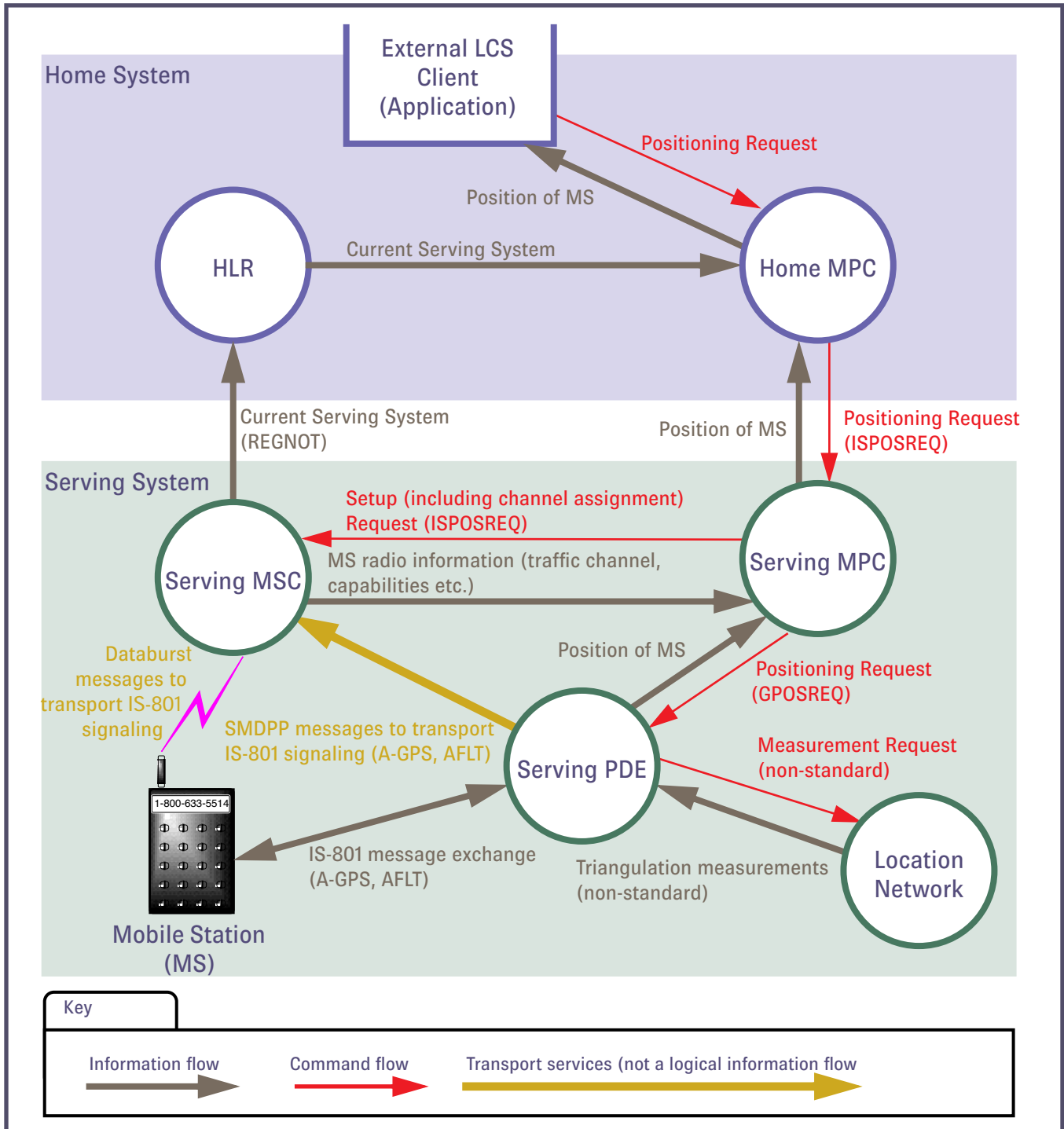


Figure 1 shows the basic flow of data within the PN-4747 reference model.

When an external application needs to obtain the position of a mobile, it sends a query to the Home System's MPC (Mobile Positioning Center). This obtains the identity of the system currently serving the mobile from the HLR, and it also validates the right of the client to obtain the position.

The Home MPC requests position from the current Serving MPC, which will request current radio environment information from the MSC and, in the case of A-GPS, may request a traffic channel.

The position acquisition is controlled by the PDE, either by network triangulation or by IS-801 messaging (A-GPS). The calculated position returns by the same path.

### To Be Continued...

We will continue our discussion of PN-4747 location services with a more detailed look at the protocol in the **March, 2003** issue. We will also discuss issues such as Quality of Service, privacy and interactions with emergency calls.

## 3GPP TSG SA#18 Update

TSG SA, the 3GPP Technical Specification Group for Service and System Aspects, is responsible for the overall architecture and service capabilities of systems based on 3GPP specifications and for cross-TSG coordination.

The most recent TSG SA meeting was #18, held in New Orleans during December, 2002. A complete calendar of upcoming meetings can be found at:

[www.3gpp.org/Meetings/meetings.htm](http://www.3gpp.org/Meetings/meetings.htm)

At that meeting, TSG SA was informed of the dissolution of the Mobile Wireless Internet Forum (MWIF), which eliminates it as a 3GPP Market Representation Partner

(MRP). MWIF is being replaced by OMA ([www.openmobilealliance.org](http://www.openmobilealliance.org)). There will be ongoing discussions regarding how work will be divided between 3GPP and OMA.

Ian Sharp of Nortel Networks was appointed as the chairman of the TSG SA Future Evolution *ad hoc* committee. The existence, organization and future of this *ad hoc* will be reviewed at TSG SA#20 (June, 2003).

### TSG SA WG1 – Services & Features

TSG SA Working Group 1 (SA1) is responsible for the definition of 3G services and features. It sets high level requirements for the overall system in Stage 1 descriptions. These documents describe the services and

features, provide requirements for their operation, charging and accounting, and also identify technical and operational issues to meet market requirements.

At the December, 2002 meeting, it was announced that the current chairman would not stand for re-election in January 2003, due to other commitment.

Major areas of work for SA1 are IP Multimedia Subsystem (IMS) and Messaging. Work on the *Push Services* Stage 1 has been completed, and the Sub-Working Group has therefore been closed.

See **Table 1** for the status of all the specifications (TS) and reports (TR) managed by this group.

**Table 1: 3GPP TSG SA Working Group 1 (Services & Features) Reports and Specifications**

Document	Title	Status
tbd	Study of subscriber and operator relationship in IMS and related ISIM requirement for Rel 6	New work item.
TR 21.905	Vocabulary for 3GPP Specifications	
TR 22.934	Feasibility study on 3GPP system – Wireless Local Area Network (WLAN) interworking	Rel 6 version being revised.
TR 22.940	IMS (IP Multimedia System) Messaging; Stage 1; Rel 6	Rel 6 version being published.
TR 22.950	Priority Service Feasibility Study; Rel 6	Rel 6 version being revised.
TR 22.951	Network Sharing	
TS 22.066	Support of Mobile Number Portability (MNP); Service Description; Stage 1	Rel 6 version being published.
TS 22.067	Enhanced Multi-Level Precedence and Preemption Service (eMLPP); Stage 1	
TS 22.071	Location Services (LCS); Service Description; Stage 1	Rel 6 version being revised.
TS 22.078	Customized Applications for Mobile network Enhanced Logic (CAMEL); Service description; Stage 1	Rel 5 version being revised.
TS 22.101	Service Aspects; Service Principles	Rel 5 and Rel 6 version being revised.
TS 22.127	Stage 1 Service Requirement for the Open Service Access (OSA)	
TS 22.135	Multicall; Service description; Stage 1	Rel 4 version being revised.
TS 22.140	Multimedia Messaging Service (MMS); Stage 1	Rel 4, and Rel 5 versions being revised. Rel 6 being published.
TS 22.174	Push Services; Service Aspects; Stage 1	Rel 6 version being revised.
TS 22.233	Transparent End-to-End Packet-Switched Streaming Service	
TS 22.243	Speech Recognition Framework for Automated Voice Services; Stage 1	
TS 22.250	IMS (IP Multimedia System) Group Management Capability	Rel 6 version being published
TS 22.340	IMS (IP Multimedia System) Messaging	

## TSG SA WG2 – Architecture

3GPP TSG SA WG2 Architecture (SA2) is responsible for the developing Stage 2 of the 3GPP network. Based on the services requirements elaborated by SA1, SA2 identifies the main functions and entities of the network, how these entities are linked to each other and the information they exchange. The output of SA WG2 is used as input by the groups in charge of the defini-

tion of the precise format of messages in Stage 3 (Stage 2 for the Radio Access Network is under TSG RAN's responsibility). The group has a system-wide view, and decides on how new functions integrate with the existing network entities.

At the TSG SA#18 meeting, it was reported the published TR 23.846 on MBMS was

incomplete with many pages missing from version 6.0.0. A corrected version will be republished.

See **Table 2** for the status of all the specifications (TS) and reports (TR) managed by this group.

**Table 2: 3GPP TSG SA Working Group 2 (Architecture) Reports & Specifications**

Document	Title	Status
tbd	Push Service	New work item.
tbd	Policy-based Control of DiffServ Edge Function	
tbd	Early UE handling in the 3GPP system	
tbd	Overall Architectural Aspects of IP-Flow-based Bearer Level Charging	
TR 23.846	Multimedia Broadcast and Multicast Service (MBMB)	Rel 6 version being revised.
TS 23.002	Network Architecture	Rel 4 and Rel 5 versions being revised.
TS 23.032	Universal Geographical Area Description (GAD)	Rel 4 version being revised.
TS 23.060	GPRS; Stage 2	Rel 99, Rel 4 and Rel 5 versions being revised.
TS 23.107	QoS Concept and Architecture	Rel 4 and Rel 5 versions being revised.
TS 23.141	Presence Service; Architecture and Functional Description	Rel 6 version being revised.
TS 23.207	End-to-End QoS Concept and Architecture	Rel 5 version being published.
TS 23.221	Architectural Requirements	Rel 4 and Rel 5 versions being revised.
TS 23.228	IP Multimedia Subsystem (IMS); Stage 2	Rel 5 version being revised.
TS 23.271	Functional Stage 2 Description of Location Services (LCS)	Rel 4, Rel 5 and Rel 6 versions being revised.

## TSG SA WG3 – Security

3GPP TSG SA Working Group 3 Security (SA3) is responsible for the security of the 3GPP system. It analyses potential security threats to the system, considers new threats introduced by IP-based services

and systems, and sets security requirements for the overall system.

Elections for the chairman position will be held in February and March 2003.

See **Table 3** for the status of all the specifications (TS) and reports (TR) managed by this group.

**Table 3: 3GPP TSG SA Working Group 3 (Security) Reports & Specifications**

Document	Title	Status
tbd	Lawful Interception in the 3GPP Rel 6 architecture	New work item.
TR 33.810	Network Domain Security / Authentication Framework (NDS/AF) Feasibility study to support NDS/IP evolution	Rel 6 version being published.
TS 33.102	3G Security; Security Architecture	Rel 99, Rel 4 and Rel 5 versions being revised.
TS 33.107	3G Security; Lawful Interception Architecture and Functions	Rel 5 version being revised.
TS 33.108	3G Security; Handover Interface for Lawful Interception	Rel 5 version being revised. Rel 6 version being published.
TS 33.200	Network Domain Security; MAP application layer security	Rel 5 version being revised.

**Table 3: 3GPP TSG SA Working Group 3 (Security) Reports & Specifications (continued)**

Document	Title	Status
TS 33.203	3G Security; Access security for IP-based services	Rel 5 version being revised.
TS 33.210	3G Security; Network Domain Security; IP network layer security	Rel 5 and Rel 6 versions being revised.
TS 55.205	Specification of the GSM-MILENAGE Algorithms: An example algorithm set for the GSM Authentication and Key Generation functions A3 and A8	Rel 6 version being published.
TS 55.216	Specification of the A5/3 Encryption Algorithms for GSM and ECSD and the GEA3 Encryption Algorithm for GPRS; Document 1: A5/3 and GEA3 Specifications	Rel 6 version being revised.
TS 55.217	Specification of the A5/3 Encryption Algorithms for GSM and ECSD and the GEA3 Encryption Algorithm for GPRS; Document 2: Implementor's Test Data	Rel 6 version being revised.
TS 55.218	Specification of the A5/3 Encryption Algorithms for GSM and ECSD and the GEA3 Encryption Algorithm for GPRS; Document 3: Design conformance test data	Rel 6 version being revised.
TS 55.219	Specification of the A5/3 Encryption Algorithms for GSM and ECSD and the GEA3 Encryption Algorithm for GPRS; Document 4: Design and evaluation report	Rel 6 version being revised.

### TSG SA WG4 – Codec

3GPP TSG SA Working Group 4 Codec (SA4) specifies speech, audio, video and multimedia codecs in both circuit-switched and packet-switched environments. It also evaluates the quality, end-to-end perfor-

mance, and considers codec interoperability with existing mobile and fixed networks.

At the December, 2002 meeting, official liaisons were established with two new organizations, the International Multimedia Telecommunication Consortium (IMTC –

[www.imtc.org](http://www.imtc.org)) and the Internet Streaming Media Alliance (ISMA – [www.isma.tv](http://www.isma.tv)).

See **Table 4** for the status of all the specifications (TS) and reports (TR) managed by this group.

**Table 4: 3GPP TSG SA Working Group 4 (Codecs) Reports & Specifications**

Document	Title	Status
tbd	Packet Switched Streaming Service	New Work Item
tbd	AMR-WB extension for high audio quality	New Work Item
tbd	Codec Work to Support Speech Recognition Framework for Automated Voice Service	New Work Item
TR 26.976	AMR-WB Speech Codec Performance Characterization	Rel 5 version being published.
TS 26.093	Mandatory Speech Codec Speech Processing Functions for the Adaptive Multi-Rate (AMR) Speech Codec; Source Controlled Rate Operation	Rel 5 version being revised.
TS 26.102	Mandatory Speech Codec; Adaptive Multi-Rate (AMR) Speech Codec; Interface to Iu, Uu and Nb	Rel 5 version being revised.
TS 26.103	Speech Codec List for GSM and UMTS	Rel 5 versions being revised.
TS 26.140	Multimedia Messaging Service (MMS); Media formats and codecs	Rel 5 version being revised.
TS 26.173	ANSI-C code for the Adaptive Multi Rate (AMR) Wideband Speech Codec	Rel 5 version being revised.
TS 26.174	Wideband AMR Speech Codec; Test sequences	Rel 5 version being revised.
TS 26.234	Transparent End-to-End Packet Switched Streaming Service (PSS); Protocols and Codecs	Rel 4 and Rel 5 versions being revised.
TS 26.236	Packet Switched Conversational Multimedia Applications; Transport Protocols	Rel 5 version being revised.
TS 28.062	Inband Tandem Free Operation (TFO) of Speech Codecs; Service Description; Stage 3	Rel 4 and Rel 5 versions being revised.

## TSG SA WG5 – Telecom Management

3GPP TSG SA Working Group 5 Telecom Management (SA5) is responsible for the management framework and requirements for management of the 3G system, delivering the architecture descriptions of the telecommunication management network (TMN) and coordinating all work pertinent to the 3G system telecom management across TSGs.

**Table 5: 3GPP TSG SA Working Group 5 (Telecom Management) Specifications**

Document	Title	Status
tbd	Charging Management	New work item.
tbd	Charging Management for bearer level	
tbd	Charging Management for IM Subsystem	
tbd	Charging Management for the service domain	
TS 32.015	Charging and Billing; 3G call and event data for the Packet Switched (PS) domain	Rel 97, Rel 98 and Rel 99 versions being revised.
TS 32.101	3G Telecom Management: Principles and high level requirements	Rel 5 version being revised.
TS 32.102	3G Telecom Management Architecture	
TS 32.111-2	Fault Management; Part 2: Alarm Integration Reference Point: Information Service	Rel 4 and Rel 5 versions being revised.
TS 32.111-3	Telecommunication Management; Fault Management; Part 3: Alarm Integration Reference Point: CORBA Solution Set	
TS 32.111-4	Telecommunication Management; Fault Management; Part 4: Alarm Integration Reference Point: CMIP Solution Set	
TS 32.200	Telecommunication Management; Charging Management; Charging Principles	
TS 32.205	Charging Management; Charging data description for the Circuit Switched (CS) domain	
TS 32.215	Charging Management; 3G charging data description for the Packet Switched (PS) domain	
TS 32.225	Charging Data description for IP Multimedia Subsystem	Rel 5 version being revised.
TS 32.235	Charging Management; Charging data description for application services;	Rel 4 and Rel 5 versions being revised.
TS 32.421	Subscriber and Equipment Trace: Trace Concept and Requirements	Rel 6 version being published.
TS 32.604	3G Configuration Management: Basic Configuration Management IRP: CMIP Solution Set	Rel 5 version being revised.
TS 32.611	3G Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Requirements	
TS 32.612	3G Configuration Management: Bulk Configuration Management IRP: Information Service	Rel 4 and Rel 5 versions being revised.
TS 32.613	3G Configuration Management: Bulk CM IRP: CORBA Solution Set	Rel 4 version being revised.
TS 32.614	3G Configuration Management: Bulk Configuration Management IRP: CMIP Solution Set	Rel 4 and Rel 5 versions being revised.

**Table 5: 3GPP TSG SA Working Group 5 (Telecom Management) Specifications (continued)**

<b>Document</b>	<b>Title</b>	<b>Status</b>
TS 32.632	3G Configuration Management: Core Network Resources IRP: Network Resource Model	Rel 5 version being revised.
TS 32.633	Core Network Resources IRP: CORBA Solution Set	
TS 32.634	3G Configuration Management: CN Network Resources IRP: CMIP Solution Set	
TS 32.642	3G Configuration Management: UTRAN Network Resources IRP: Network Resource Model	
TS 32.644	3G Configuration Management: UTRAN Network Resources IRP: CMIP Solution Set	
TS 32.654	3G Configuration Management: GERAN Network Resources IRP: CMIP Solution Set	
TS 32.661	3G Configuration Management: Kernel Configuration Management IRP: Requirements	Rel 5 version being published.
TS 32.664	Configuration Management (CM); Kernel CM Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set	