

## Genuine interoperability between standards

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One thing is very clear in the evolution of 3G – services and applications, rather than technology, are the key drivers. The inherent capabilities of 3G will inevitably produce an upsurge in the range and breadth of services that users can expect to access – irrespective of their location. However, the realisation of this potential can only be achieved if the industry embraces the concept of genuine interoperability, including past investments by operators in networks, to create a completely open mobile platform.

There has been an increasing number of initiatives taken to ensure progress is made towards achieving interoperability across the range of existing standards. As a result, there are grounds for considerable optimism that the 3G environment will succeed in establishing a fully-fledged wireless information society, enabling users to access their own blend of services from their own choice of equipment. Core factors enroute to realising the concept involve the interworking of

heterogeneous networks that are based on different standards, but which have to allow the exchange of dynamic content and comprehensive session management. End-user terminals must facilitate the high-quality reception of personal portal contents in all conditions, presupposing that any issues surrounding service continuity across multi-standard technologies have been overcome. In order to succeed, the service must be seamless, reliable and capable of satisfying every level of user demand, facilitating full geographical, technological and frequency band roaming.

The transitional path to the full 3G environment is critical and a key element involves establishing unrestricted roaming and complete service portability, an area which has seen considerable recent activity and progress, particularly in the context of GSM, GPRS and EDGE. One such initiative involved the Universal Wireless Communications Consortium for TDMA and the North American GSM Alliance for GSM, forming a team to specify the desired interoperability between these technologies.

This group – the GSM/ANSI-136 Interoperability Team (GAIT) – was formed

in March 1999 to specify a multi-mode mobile station and a network interworking function to translate between the two network protocols (GSM MAP and ANSI-41). Its work has already been translated into tangible results in the form of technical specifications for handset development and inter-standard roaming.

The rationale behind the Third Generation Partnership Project (3GPP) is to ensure that regional standards are developed in an open, consistent and compatible fashion. A growing number of manufacturers are now announcing interoperability testing in compliance with 3GPP standards, reflecting industry recognition that the future has to be in partnership rather than purely in competition.

Under the banner of the 3GPP, UTRAN and GERAN standards are being developed to guarantee interoperability, representing the ongoing development of the GSM standard. The GERAN is set to play a critical role in the evolution of GSM radio standards towards 3G services and architectures. The WCDMA standard was designed from the outset to be deployed alongside GSM, whilst the GSM standard was duly modified to support inter-



working with WCDMA. On the GSM/ TDMA interoperability front, GAIT has succeeded in publishing a total of four technical specifications to date, namely the:

- GSM Hosted SMS Teleservice Specification
- GSM/ANSI-136 Common Mobile Terminal Specification
- the GSM/ANSI-136 SIM Specification
- GSM/ANSI-136 Network Inter-working Specification

Together with the existing GSM, ANSI-136 and ANSI-41 standards, these specifications define the network elements and protocols to provide basic GSM and TDMA interoperability. To support fully automatic, two-way interoperability between GSM and ANSI-136 or AMPS, network connectivity and MAP protocol conversion are provided through a bi-directional inter-working and inter-operability function (IIF). This capability was initially defined in TIA/EIA/IS-129. In terms of implementation, the IIF can be offered via a standalone network element, or it can be integrated with the Home Location Register.

Whilst this is addressing the issues surrounding the air interface and the switch-to-switch communications aspects, there is also a need to focus on the mobile data backbone structure and the wireless internet connections, involving much more than simply the wireless access elements. The network infrastructure is evolving from

the traditional vertical models that we are familiar with today – where each network type has its own specific features and applications – into a more horizontal (layered) network. The principle behind the layered network concept is to accommodate access to the same set of special features and applications, regardless of the network used. This is wholly in line with the underlying precepts of 3G, requiring cross-industry partnerships and a completely new set of business models en route to genuine interoperability.

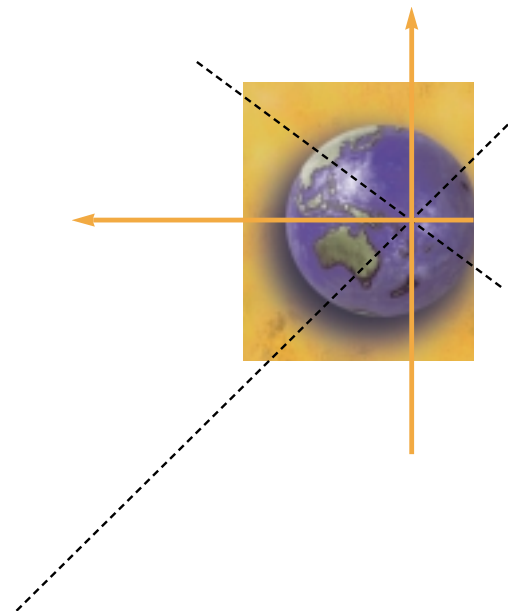
The ultimate technical goal is to establish a common core network and considerable strides have already been made towards this end. Multimode terminals, capable of supporting GSM, EDGE and WCDMA operation, are being specified. Specific roll-outs – for example, of WCDMA – have illustrated the need for handover/cell re-selection to be established between the different systems, based on issues of loading and coverage.

#### Maintaining the momentum

The motivation is in place – at the most recent gathering of the 3GPP Market Representation Partners held in San Francisco in November 2000, a number of key objectives were announced. Quoting from the 3GPP MRPs' report: "collaborative standards-making at the global level is

actively supported, in order to ensure that the mass market benefits directly from new services, economies of scale and non-proprietary technologies – coupled with widespread access, interoperability, roaming, a wide choice of terminals, and user terminal compatibility." The groundwork for interoperability has been laid down, and there is a clear road map in place for the transitional period from 2G to 3G.

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