IMS (IP Multimedia Subsystem) for the Transport Industry

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Conference report

by Peter Vermaat, TRL

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1 Introduction

The IP Multimedia Subsystem (IMS) is a new standard that defines the network domain dedicated to the control and integration of multimedia services. The objective of this seminar, organised by ITS UK, innovITS and mobileVCE, was to translate the new technology features and advantages into benefits and enhancements for the Transport Industry and delivery of services to the Transport User.

The IMS is an international effort, originally started by the wireless standards body 3rd Generation Partnership Project (3GPP), but driven largely by the major telecommunications companies, e.g. BT, Vodafone, France Telecom.

The seminar sought to address some of the questions the Transport Industry are asking:

• What benefits will IMS bring to the Transport Industry ?

• What will the future implementation of IMS mean to me ?

• What will life in the future be like with IMS ?

• How will IMS deliver benefits for the Transport User ?

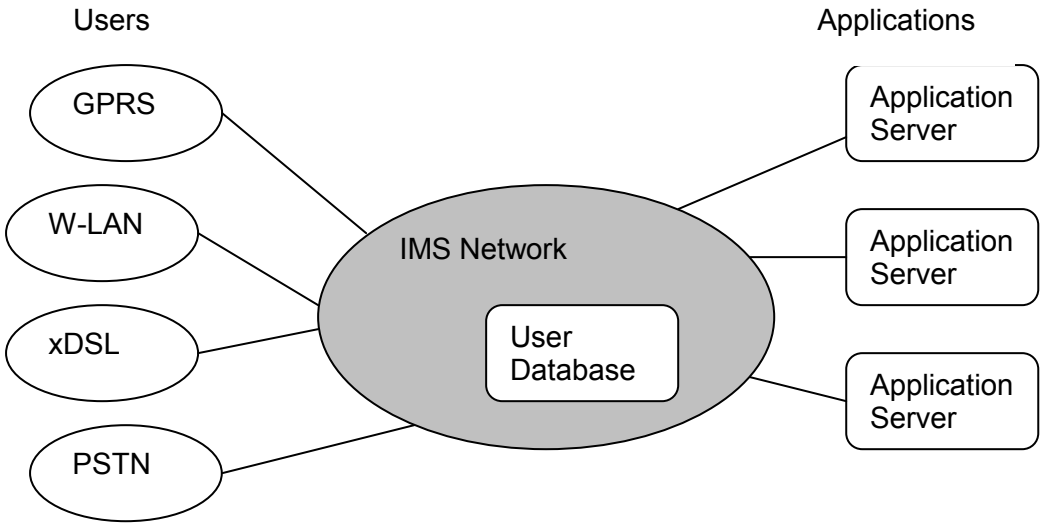
The seminar was attended by a cross-section of interested parties, including representatives from telecommunications companies (BT, Orange), suppliers of ITS equipment (Logica, Efkon), representatives from the motor industry (Jaguar), consultancies and research organisations (TRL, Erlang)

The speakers were drawn largely from the telecommunications industry (BT, Orange, Vodafone), BAE, with a technical overview by Dr Walter Tuttlebee, Chief Executive of MobileVCE. The programme is given in Annex A.

2 What is the IMS?

The existing IP (Internet Protocol) based networks provide a bit-pipe between the source and destination of a data connection. The network has no knowledge or control of the data in the connection or what services are being offered. This makes it difficult for the network provider to deliver connections which give services different priorities based on need and cost.

The IMS, shown diagrammatically overleaf, is an overlay IP network which allows service providers (which may be the network provider, or third parties) to provide services to users in a controlled fashion. The user would need to subscribe to IMS services, i.e. the network would no longer just be a bit-pipe. The IMS is access agnostic, so the user is able to connect using the most appropriate access means, e.g. GPRS, W-LAN, WIMAX for mobile users, xDSL or PSTN for fixed users. Roaming, a requirement for effective mobile services, is an integral part of the IMS.



Interaction with the IMS is session based, allowing the user to utilise a variety of services within a single session. The user logs on to the IMS at the start of a session. The IMS provides all the authentication for users, thereby relieving the application providers of this task. A User Profile stored in the User Database controls the services the user has access to.

In some ways the IMS is similar to the Internet in that it allows users to access a wide range of services with a single connection; however it goes further in that mobility and roaming are built into the network, and that the network operator has a greater awareness of what data is being transmitted on its network.

The IMS provides standardised interfaces for application providers. This is not a service creation tool, but facilitates the creation and integration of new services. The standardised application interfaces facilitate consistency and reliability in the creation of new services. It also promotes re-use and could save on development costs.

3 Examples of IMS

3.1 An example of IMS in action

A person in Cardiff needs to attend a meeting in London. Currently, they could check travel options by using a website like TransportDirect which gives route options. If driving, addresses need to be entered into a PDA or transferred to paper. In the car, the information needs to be entered into the SatNav system. The Congestion Charge, if applicable, could be paid over the internet or by mobile phone. The Severn bridge toll for the return journey has to be accounted for. If there is a hold up on the M4, this information will often be too late to make alternative arrangements.

The IMS alternative is much easier. On checking the travel options and deciding to drive, address and route information is automatically downloaded to the user's PDA and/or phone, and subsequently to the car's SatNav system. The Congestion Charge and Severn Bridge tolls are confirmed with a simple button click. Information regarding congestion on the M4 would be automatically forwarded to the SatNav system and alternative routes suggested. Should the user decide to switch to the train, tickets will be ordered and the Congestion Charge cancelled.

3.2 An existing demonstrator

BT, France Telecom (Orange) and Vodafone have created a demonstration Road User Management (RUM) system to prove that IMS is a viable technology to be used in the transport sector. The RUM demonstrator uses a number of IMS services, for example the Presence service.

The Presence service provides real time information about the status of subscribers. The information can include a range of details, from whether a device is on or off, through to more advanced information about users' availability, such as whether they are driving or in a meeting. Presence can provide visibility on how best to communicate with other subscribers, be it voice, text or IM. This provides higher level services, or other users, with information on the most appropriate means of communication.

4 Benefits of IMS

4.1 Overall benefits

- Resource Management. The network operator is aware of the data on its network, so it is able to manage its resources and provide guaranteed Quality of Service (QoS) to the users.
- Central billing. The user has a single sign-on and receives a single bill for all the services used. Awareness of the data on the network allows more flexible billing, not just a price per bit. Micro-payments are realistic in this model.
- Quality of Service. The network operator is able to provide guaranteed QoS to those customers who require and are prepared to pay for it.
- Service integration. Multiple services can be provided in a single session. Standard interfaces to the network allow easier creation and development of services.
- Fixed/mobile convergence. As the IMS is access agnostic, the network does not care if the user is fixed or mobile. Note that this was one of the prime reasons the IMS project was originally started by 3GPP.
- Security. Users will access services via a single logon. IPSec, a proven and reliable security framework, is used to provide encryption and/or authentication of data. User authentication can be achieved in a number of ways, e.g. username/password combinations or SIM cards.

4.2 Transport services which can benefit from IMS

- eCall, an automatic emergency call from vehicles, normally triggered by an external event, e.g. an accident. The current draft specification uses a circuit switched data call, but this is likely to be migrated to a packet switched service soon, which would make it a good candidate for an IMS service.
- Road User Charging. Most road user charging schemes make use of a number of services (location, charging, billing etc) and will benefit from service integration.
- Pay as you drive, both as a form of road user charging and as a means of insurance.
- Remote vehicle access.
- Dynamic route guidance.

5 Timescales

IMS exists now, although only a limited number of services has been implemented at this stage.

Full commercial realisation of IMS is probably 2-5 years away.

6 More information

http://www.rennes.enst-bretagne.fr/~gbertran/files/IMS_an_overview.pdf provides a comprehensive overview of IMS, but is quite technical

http://www.bcr.com/carriers/public_networks/ims_101_what_need_know_now_2005061514.htm give more information about the history of IMS, and is more business focussed

7 Recommendations for the Highways Agency

There is a strong expectation from the promoters of this standard that IMS will play a central role in the provision of road user management. While this is not guaranteed, the HA should monitor this standard and seek to influence future developments if this is appropriate.

It should be noted that the seminar was presented by strong advocates of IMS. There are those to whom the very idea of IMS is an anathema and goes against the principles of the internet as a level playing field. They argue that the advantages claimed by the proponents are illusory in that integrated services can already be provided by the existing IP based networks, and provide network operators with the ultimate complete sanction of what services the users are able to access.

There is currently no consumer pull for the services and facilities provided by the IMS, and as such it should currently be considered risky to depend on it becoming a success. However the strength and influence of the organisations pushing the standard is such that it cannot be ignored.

Glossary

3GPP	Third Generation Partnership Project, an international collaborative project involving the telecommunications standards authorities of Europe, Japan, China, North America and Korea
eCall	Automated Electronic 999 service for vehicles
GPRS	General Packet Radio Service, a packet switched data service overlaying the GSM mobile network
IM	Instant messaging
IMS	IP Multimedia Subsystem, the subject of this report
IP	Internet Protocol, the data communications protocol underlying the internet
IPSec	IP Security, a standard for secure data communications
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RUM	Road User Management
SIM	Subscriber Identity Module, an electronic smart card used to authenticate users. Typically used in mobile phones.
WiMAX	Next generation high-speed Wireless LAN and MAN (metropolitan area network which covers a larger area than a LAN) protocol
W-LAN	Wireless Local Area Network
xDSL	any of a variety of Digital Subscriber Line, providing high speed internet access over normal telephone lines

Annex A: Programme

Title	Presenter	Organisation
Welcome/Introduction	Neal Skelton	Head of Professional Services, ITS(UK)
Setting the Scene	Dr. Walter Tuttlebee	Chief Executive, MobileVCE
IMS and Service Development	Claudiu Stefanescu	Senior Research Engineer, France telecom
BT's 21CN and Intelligent Transportation	Daryl Dunbar	Director 21CN Portfolio Development
Applications in and IMS Environment	Ulrich Dietz	Vodafone Group R&D, Germany
IMS for ITS – Managing Information Security Risks	Zia Hayat	Research Engineer, BAE Systems
Road User Management Services and Video	Stephen Hope	Marketing Intelligence,& Business Eco-System Advisor – France Telecom. Lead Partner, RUM Consortium
Thanks and closure	Neal Skelton	Head of Professional Services, ITS(UK)