



IQUEST

Telecommunications Case study

Rich media services for the future: the IP Multimedia Subsystem (IMS) Solution

■ Client: Hewlett-Packard

HP focuses on simplifying technology experiences for all of its customers from individual consumers to the largest businesses. With a portfolio that spans printing, personal computing, software, services and IT infrastructure, HP is among the world's largest IT companies, with revenue totaling \$107.7 billion for the four fiscal quarters ended Jan. 31, 2008. More information about HP (NYSE: HPQ) is available at www.hp.com

■ Project overview: an innovative telecom network architecture

Telecommunications industry has been experiencing for a while now a decrease in revenues, customers being discontent with unappealing inadequate telecom services. Existing telecom networks were limiting service delivery to the end user. This meant that a data network could only deliver data, but not telephone services; a telephone network could only deliver telephone traffic, but not high-speed data. This network dependency indicated that the service provider could not change, enhance or provide new services to respond to increasing customer demand.

The emerging IMS (IP Multimedia Subsystem) architecture relies on the need for a unified network capable of handling all type of IP-based multimedia traffic.

Working on behalf of a worldwide telecommunications operator, our Client aimed to develop a converged VoIP community service planned to be offered over the Internet.

■ Project description: a brand new service

The overall project goal was to integrate the new VoIP-based telephone service with legacy conventional and mobile telephone systems: by doing so implementing today's telephony services on IMS (IP Multimedia Subsystem) architecture.

iQuest was commissioned to provide the architecture, to design, develop, test and integrate the solution.

Approximate effort: 4000 person-days, plus 3-year support.

■ The Solution: interactive media

The service allows its subscribers to use traditional mobile phone services (voice and video calls, SMS, MMS) from their PC, over any broadband Internet connection, using their existing mobile phone number. Additionally it provides access to typical Internet community services: Instant Messaging, IM conference; plus IMS-specific services such as Rich Presence Information (status, avatar, etc.), contact list management, etc.

Service Features include:

- Fully Session Initiation Protocol (SIP) compliant
- Call-in and call-out features
- Call hold and wait
- Video calls
- Call History
- SMS/MMS
- Instant Messenger (SIP/SIMPLE based)
- 3-way audio conferencing
- File Transfer
- Contact and group list management
- Presence
- Skinnable
- Toolbars for both Microsoft Internet Explorer and Mozilla Firefox
- Integration with other communities like MSN, YAHOO, JABBER (XMPP), Google Talk, iCQ

iQuest developed both the client application and server side software. For the application servers we used a standardised solution based on 3GPP IMS architecture. HP's responsibilities included: requirements management, planning and high-level design, change management, requirements management and communication with the end client. The iQuest project team was responsible of requirements management, detailed design, software development, testing, maintenance, quality management, as well as on-demand continuous onsite support.

The integration between IP solutions and traditional telephone systems solves the interconnection difficulties between video/audio, SMS, MMS.

Additional challenges lay in the strict requirements for robust system performance, availability, scalability, security, standard compliance (3GPP and OMA).

Specific availability and scalability constraints included:

- No single point of failure
- Redundancy from hardware to application level
- n+1 redundancy for optimal resource utilization
- Online update and configuration without downtime
- Separation of services
- Horizontal and vertical scaling possibilities
- Scalability: adding a new box

■ Technologies

The solution developed is a converged VoIP community service, fully based on open source software.

Open source systems:

- OpenSER - SIP Server
- KANNEL / MBuni - SMS/MMS Gateway
- ASTERISK Announcements Server
- APACHE - HTTP Server

Programming languages: C++, Java

Storage solutions:

- Database: MySQL
- OMA compliant XDMS

■ Challenges and Solutions:

Challenge	Solution
Very tough timeline (start August 2007, start of acceptance November 2007)	iQuest started the project early (March 2007), building up core components and the project team, minimizing technical risks and improving the feasibility in the given timeline.
Large team of people involved (35-40), only on the iQuest side. Overhead and dependencies.	The team was organized in sub-teams with technical areas of responsibilities. Clear dependencies were specified, and work was done easier in parallel.
Production-like environment was not available until very late, raising the risk of integration problems.	Based on available standards and definitions, simulators were implemented for various interacting systems. An open IMS core was used to test the entire server solution.
High availability requirements.	The modular approach for the server components allows for stateless processing, therefore scalability and easy-to-implement availability and failover.
Future portability for the client application, making it easy to add new features without major redesigns.	The client application was based on the QT framework, allowing the development team to concentrate on functionality instead of multi-platform issues and UI control design.

■ Results

Powerful personalization and collaboration options allow for maximum end-user experience and satisfaction, through common customer style guides and user-friendly configuration. The solution provides cost effective calls and enables secure and seamless communication worldwide by migrating existing services to IP telephony, inline with VoIP market conditions and constraints, without impacting business production efficiency or output, by reuse of existing and proven components. It addresses any type of end users, being appealing especially to businesses and long-distance callers, due to significantly decreased charges from traditional calling. Another solution design principle relies on compliancy to standards and limited changes to existing systems. Still, the solution allowed for high flexibility feature, our customer having the capability to influence the solution based on business needs and market demands.

■ Benefits: into the future

For the first year of existence, the service developed is estimated to have over 1 million users.

This relies on the power of IMS: it gives the end user a converged service experience over any type of access medium, taking advantage of features that the solution is putting together, some of which include caller ID, call waiting, 3-way calling, speed dialling, call forwarding, and free voicemail; while at the same time promising operators a network capable of delivering convergent services (voice, video, data, and messaging), irrespective of the type of network on which they are being run. All this with a level of service quality that is either consistent with or better than legacy networks.

Another feature, especially for business customers, is the ability to access the phone network away from office premises, whilst still being able to keep track of office calls and having access to the office phone system features. Similarly, regular customers can also benefit from its flexibility, using their designated number to connect to any high-speed internet connection and immediately utilise the same number for making and receiving calls.

About iQuest

Headquartered in Germany and having two development centres in Romania, iQuest is an IT solution provider delivering customised solutions in financial services, telecommunications, life sciences, logistics, media and IT. With over 12 years of experience and more than 320 employees in its 7 European locations, iQuest delivers best-in-class services for long-term clients in Germany, the United Kingdom, Switzerland and Sweden.