Service development in the internet age

Exploration Programmes:
Corporate Technology Explores Future Telecommunications

Service Development in the Internet Age

Traditionally, the telecom operator's domain has been closed to external service providers, but new technology developments will soon allow open service provisioning. Third-party application developers and external service providers will be able to create and offer their own services without the direct intervention of an operator. Based on the Internet experience, this can be expected to lead to a huge diversity of services and content. In future, operators like Swisscom may choose to adopt open service provisioning to increase traffic or be compelled to open the network to match the service offerings of competitors.

The Exploration Programme "Open Communication Services Architecture" explores and develops person-to-person and person-to-content communication services based on an open communication service architecture, allowing Swisscom to offer a full range of new services with a shorter time-to-market, as well as reduced development and operation costs.
With its Exploration Programmes, Corporate Technology is exploring telecommunication technologies and new service possibilities with a long-term view of 2–5 years. Further, the expertise built up in the course of this activity enables active support of business innovation projects.

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Fierce competition in a deregulated market is encouraging telecom operators to enhance their service portfolio to reduce churn and attract new customers. But in today's telecom network, applications and services are typically part of the operator's domain. While this network-centric approach is excellent for simple massmarket applications, such as the 0800 number, it does not fit well with the requirements of the Internet age.
Currently, new technologies are being defined that combine the benefits of the network-centric approach – economies of scale and reliability – with the creativity and power of the IT industry. In future, applications will be built, tested and operated by enterprises outside the network operator domain. An open application interface will facilitate the development of new services and could be an important asset to help Swisscom accelerate the development of revenue-generating services.

Open Service Provisioning is expected to lead to increased network traffic, while maintaining the security and integrity of the operator's network. Opening the network may become a necessity for an operator like Swisscom since the battle for customers and their data traffic will be facilitated by a diverse portfolio of services at attractive prices.

The development of new services in the telecom environment typically requires the introduction of a corresponding service platform. This often means that the introduction of new services is cost-intensive and slow. In particular, the interaction of new service platforms with legacy software (billing etc.) can be cumbersome. An open framework for the rapid development of converged voice-data services will overcome this problem. As a result of the widespread Internet use, new converged voice-data services will become more and more important. To reduce time-to-market, telecom operators will need to open their network infrastructure in a controlled way to allow access by third party service providers. This will it make possible to reduce service development costs and to leverage the existing network infrastructure. Fig. 1 gives an illustrative example of a simple converged voice-data service.

Exploring Open Services at Corporate Technology
Swisscom Mobile AG and Corporate Technology currently participate together in the EURESCOM P1110 project on Open Service Access. The main objectives of this project are to assess the OSA approach, specifications and products, as well as to demonstrate service development using OSA. Through this activity, Swisscom gains deep insight into the OSA approach which will allow to assess the business benefits to be expected from an open platform for value added services.
In addition, upcoming standards and industry products for open services are monitored and evaluated in the context of the Exploration Programme "Open Communication Services Architecture". This work is carried out in close co-operation with the Business Unit Fix Com and the results will be integrated in Swisscom's MASS project. Hands-on experience with an industry product will be gained by developing a converged voice-data service using the SURPASS product family (Siemens).

Technology for Open Services
Speech, historically, has been the basic telecom service. It has been enhanced by supplementary services, such as call-forwarding and call-waiting. Significant

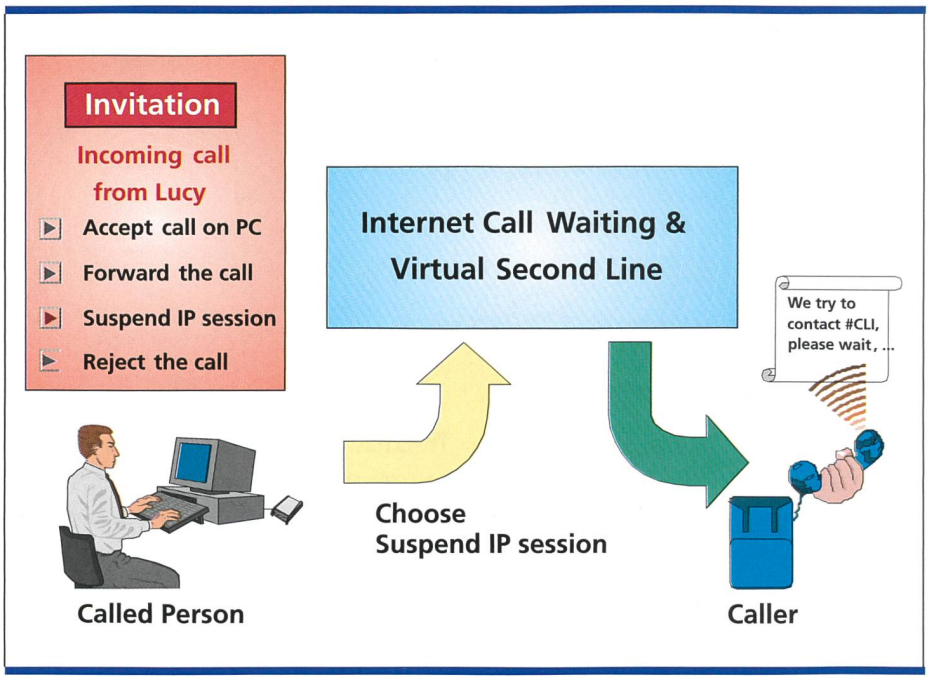

Fig. 1. Illustrative example of a simple converged voice-data service (Internet Call Waiting). When the user is online and receives a call, the Internet session is suspended and the call either accepted on the PC, forwarded or rejected.

progress was made with the introduction of Intelligent Networks which separated the service aspects from switching. An exchange could now detect 0800 numbers, for example, and then automatically interact with a centralised service control point to, perhaps, translate the 0800 number to a new telephone number based on the caller's location. Since service intelligence was centralised, operators could more easily implement their own services. Today, open service technologies take service evolution one step further by extending service creation and provision capabilities beyond the operator domain to third parties such as external service providers and application developers. Relevant technologies include *Parlay, Open Service Access* (OSA) and *Java API's for Integrated Networks* (JAIN).

The Parlay group was established in 1998 to develop technical specifications to allow third parties to create services using an open Application Programming Interface (API). The Parlay API specifications [1] consist of service interfaces offering applications access to a range of network capabilities and information, as well as framework interfaces providing the supporting capabilities necessary for security and management. Currently, the framework interfaces provide service registration, subscription and discovery, as well as authentication, authorisation and integrity management. The service interface functions provide access to traditional network capabilities such as call management, messaging and user interaction. Parlay implementations are based on servers running applications outside the telecom operator's domain. To offer Parlay, Swisscom would need to deploy a Parlay Gateway providing secure and manageable access to network capabilities (fig. 2).

The 3rd Generation Partnership Project working group on OSA is currently addressing the service needs of UMTS operators [2]. This work takes into account the Parlay and JAIN initiatives, and extends the results for mobile aspects. OSA is therefore complementary to other initiatives with a specific focus on 3rd Generation mobile needs (fig. 3).

ETSI SPAN 12 is currently standardising application interfaces for Service Providers and Network Operators. Their work includes OSA application interfaces and media gateway control packages. Joint activities have been agreed with

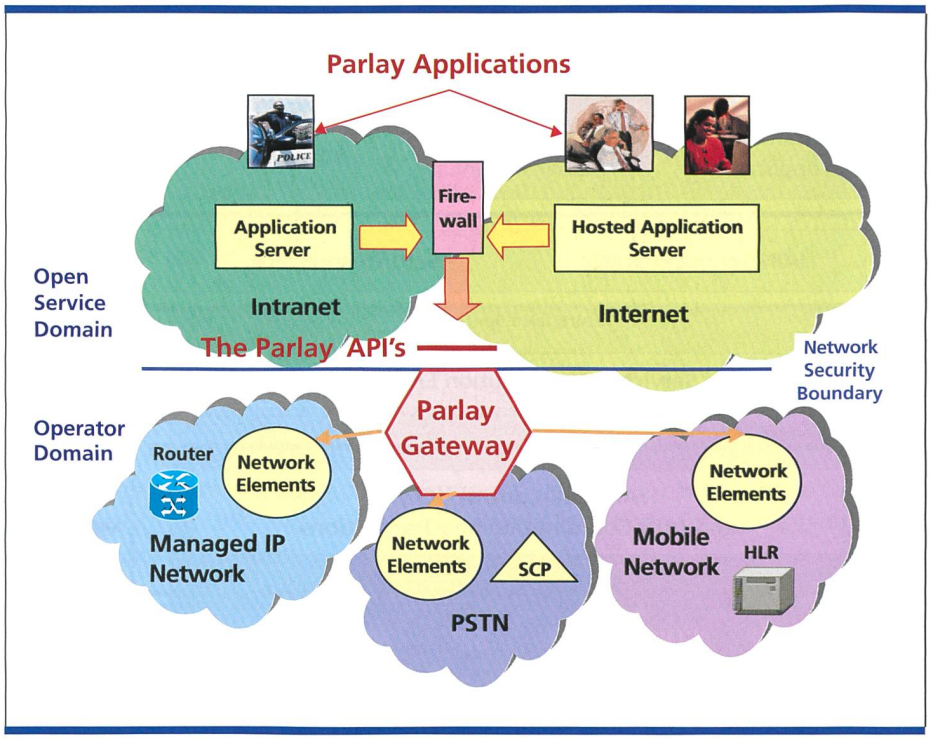

Fig. 2. Parlay applications running on external servers use the Parlay Application Programming Interface to communicate via the Parlay Gateway with the operator's network. Although service control is running outside the operator domain, integrity and network security are guaranteed by the Parlay Gateway. (PSTN: Public Switched Telephony Network; SCP: Service Control Point; HLR: Home Location Register).

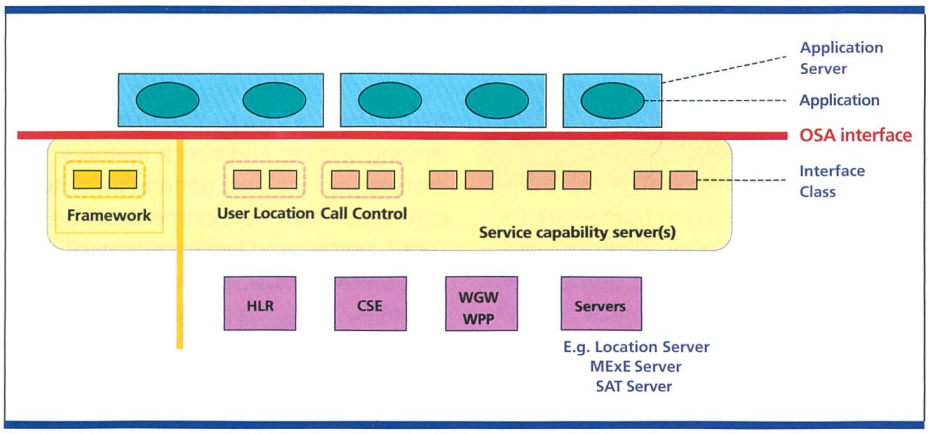

Fig. 3. Open Service Access (OSA) defines an OSA-interface. Applications running on servers located outside the mobile operator domain communicate via this interface. (CSE: CAMEL Service Environment; WGW: Wireless Application Protocol Gateway; WPP: Wireless Application Protocol Push Proxy; MExE: Mobile Station Execution Environment; SAT: SIM [Subscriber Identity Module] Application Toolkit).

3GPP CN2 (for IN CAP) and 3GPP CN 5 (for OSA). The protocols for core services such as Call Control, Call Control Charging, Mobility Management and User Interaction will be jointly developed with the Parlay and JAIN consortia.

JAIN is part of Sun's Java Community Process. The JAIN API's for integrated networks [3] are a set of Enterprise Java Bean (EJB)-like API's which are expected to facilitate rapid service development using the Java platform. They provide a framework for building and integrating services on top of converged networks. The objective of the JAIN community is to create an open market for services across such networks. Java Call Control (JCC) offers a unified call model in-

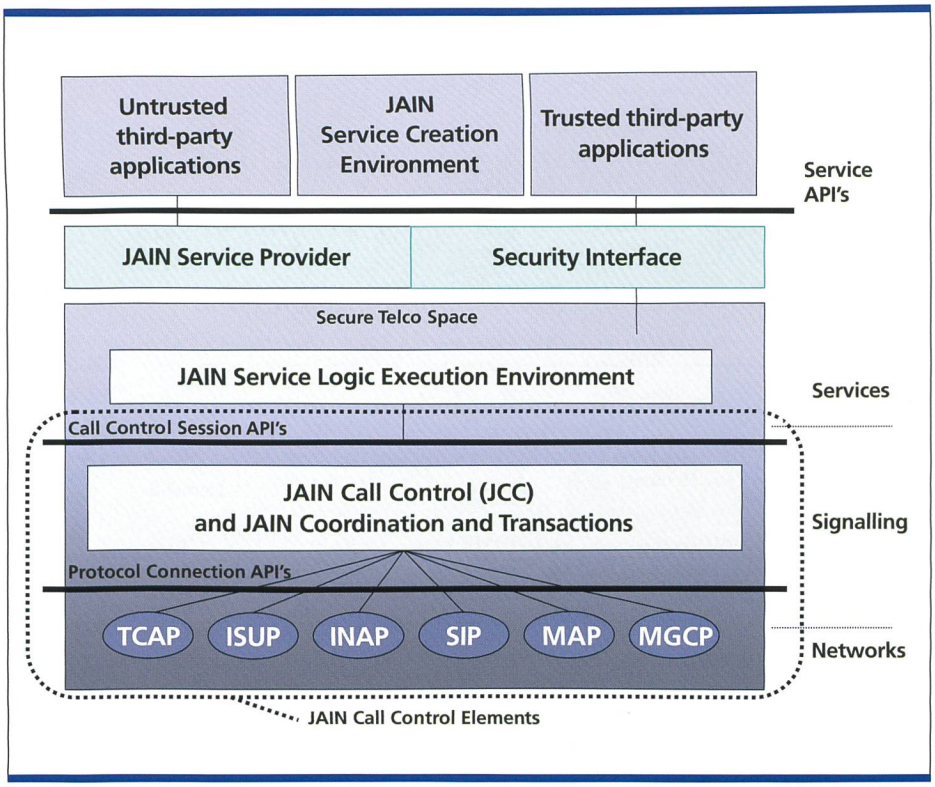

Fig. 4. The JAIN (Java API's for Integrated Networks) environment allows JAIN Trusted Third Party Applications to communicate via a Security Interface with the operator's environment. Within the telecom environment, Services and Signalling layers communicate via API's. (TCAP: Transaction Capabilities Application Part; ISUP: ISDN User Part; INAP: Intelligent Network Application Part; SIP: Session Initiation Protocol; MAP: Mobile Application Protocol; MGCP: Media Gateway Control Protocol).

corporating the basic features of the Java Telephony API (JTAPI) as well as the Parlay Call Control Service. This provides an extensible Java-based framework for the support of complex call processing applications. An illustration of the JAIN environment is given in fig. 4.

Conclusions

By opening the network and allowing applications to have secure access to operator resources inside the network, an opportunity will be created to deliver thousands of services rather than the dozens currently available. This will change the telecommunications market from many proprietary, closed systems found today to a single network architecture where services can be rapidly created and deployed.
Application Programming Interfaces will provide a new level of abstraction for service creation across the telecom networks, and will enable the integration of Internet and Intelligent Network protocols. The new technologies will facilitate service creation by operators as well as third parties, allowing them to extend existing services and enrich features. This ensures that the next generation of telecom application development will be faster, simpler and less expensive.
Corporate Technology is currently addressing both Mobile and Fixed aspects of open services technology via its EURESCOM participation and through its Exploration Programmes.

JAIN:
http://java.sun.com/products/jain/

OSA:
http://www.3gpp.org/TSG/CN5.htm

PARLAY:
http://www.parlay.org/specs/index.asp

Outlook

The next phase of Parlay will develop network service Application Programming Interfaces for generic charging/billing, enhancement of the user profile and subscription data handling, as well as for policy management. New framework interfaces will also be developed for management support, and new generic application interfaces are planned for services such as "Mobile E-Pay".
The Open Services Access working group of the 3rd Generation Partnership Project (3GPP TGS CN WG5) is currently developing API's for UMTS. Their specification work includes the definition of interface classes, methods and detailed behaviour for those classes. An IDL specification and functional mapping of the OSA interfaces to UMTS network protocols is being produced. This specification work is carried out jointly with ETSI SPAN 12 and the Parlay consortium, in cooperation with the JAIN consortium. [6, 9, 10]

Zusammenfassung

Um im Internet-Zeitalter schnell auf sich abzeichnende Kundenbedürfnisse zu reagieren, wird die Entwicklung einer «Open Service Platform» oder «Open Service Access» für die rasche Entwicklung von neuen, vielfältigen Diensten, wie beispielsweise Sprach-, Daten-, Multimedia- oder kombinierte Dienste, in Zukunft weiter an Bedeutung gewinnen. Klassische Telekommunikationsanbieter öffnen mit dieser Plattform ihre Netzwerkinfrastruktur für Drittanbieter, um neue Mehrwertdienste auf ihrem Netz anzubieten.

Abbreviations

3GPP CN	Third Generation Partnership Project Core Network subgroup
API	Application Programming Interface
CAP	CAMEL Application Part
HLR	Home Location Register
IDL	Interface Description Language
IP	Internet Protocol
IN	Intelligent Networks
JAIN	Java API's for Integrated Networks
MASS	A Swisscom project to define and implement the future network architecture
OSA	Open Service Access
UMTS	Universal Mobile Telecommunications System

References

[1] Parlay APIs 2.1, Parlay Group Inc., 2001
[2] 3GPP TS 29.198-1 V4.0.0 OSA API Part 1 Overview (Release 4), 2001
[3] The JAIN APIs: Integrated Network APIs for the Java Platform, 2001

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Johannes Schneider *studied Physics at the University of Berne and graduated in optics in 1988. He joined the Telecom PTT R&D department in 1989, where he worked on the technology of integrated optics until end of 1993. From 1994 to 1998 he worked in access network transmission, specifically Fiber in the Local Loop, ATM and interconnection. In 1999, his work focused on new residential service technology, mainly multimedia and the man-machine interface. In 2000, he was working in the area of Service Management for IP networks, for UMTS and for Fixed Telephony.*

Oliver Rosenbau

PC/EDV-Lexikon
Informationstechnik
VDE Verlag GmbH, Berlin, 2000. 332 S., kart., Fr. 36.–, DM 39.–, öS 285.–, Euro 19.90, ISBN 3-8007-2501-0, Homepage: www.vde-verlag.de

Das PC/EDV-Lexikon enthält rund 7000 Stichworte zu allen interessanten Bereichen der EDV- und IT-Technologie. Die Neuerscheinung ist ein sehr praktisches und übersichtliches Nachschlagewerk. Neben Informationen zu technischen Bestandteilen des PCs gibt das Buch Hinweise zu bekannten Softwareprogrammen und Programmiertechniken, erklärt Programmiersprachen sowie die unterschiedlichen Betriebssysteme. Internet-Anbindungen werden genauso behandelt wie Hard- und Software-Hersteller. Es sind die wichtigsten Abkürzungen aus allen Themenbereichen enthalten. Aufgrund der zahlreichen Querverweise vermittelt die Neuerscheinung auch einen guten Überblick über zusammengehörende Themen. Das Lexikon ist mit seiner klaren Struktur sowohl für PC-Anfänger als auch für EDV-Spezialisten von Interesse.

Stanislas Dehaene

Zahlensinn
oder warum wir rechnen können
Birkhäuser Verlag 1999. 312 S., geb., Fr. 52.–, DM 58.– , öS 423.–, ISBN 3-7643-5960-9.
Homepage: www.birkhauser.ch

Das Thema von Stanislas Dehaene ist das menschliche Vermögen, mathematische Operationen auszuführen. Er nennt es den Zahlensinn, der ganz offenbar auf eine bestimmte Struktur des Gehirns zurückzuführen ist. Wie kommt der erwachsene Mensch zu Trigonometrie, Differentialrechnung und anderen komplizierten Rechenoperationen? Die Befähigung zur höheren Mathematik beruht nach Dehaene auf der Erfindung von symbolischen Systemen, um mathematische Zusammenhänge in Wort und Schrift auszudrücken. Er sieht diese Entwicklung als fortlaufenden kulturgeschichtlichen Prozess. Dehaene zeigt darüber hinaus aber auch, welche Schaltkreise im Gehirn für diese Wechselbeziehung zwischen menschlicher Gehirnstruktur und mathematischer Entwicklung verantwortlich sind. Sein Buch ist eine spannende Lektüre für alle, die nicht nur rechnen können, sondern auch wissen wollen, warum sie es können.