Toward the all-IP vision

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In a previous article, we examined the concept of combinational services, describing how Ericsson believes the mobile communications industry can introduce multimedia services quickly and efficiently by combining the best properties of packet capabilities with established, highly tuned, circuit-switched voice services. We also promised to return to the topic to discuss the true, long-term target architecture for multimedia services.

This time, the defining quality is that all media components can be delivered over a unified IP infrastructure, including mobile networks. This changes how we create and deploy services as well as the nature of the IP networks themselves. Using evolving tools, we are able to unify fixed and mobile access to deliver services to end-users in a coherent, appealing and resource-efficient manner. End-users can thus experience a wide variety of high-quality content anywhere and at any time. This article discusses the market forces and technical opportunities that shape this new world.

Network vision

The future communications network will treat all forms of access as equals: every service delivered over every access, and fully exploiting the benefits of respective technologies. This includes interoperability with legacy, fixed and wireless telephony. In particular, the network will deliver services over a unified control and media infrastructure that supports fixed access and all forms of wireless access. Interestingly, the distinction between fixed and mobile is becoming increasingly irrelevant. Many of today's "fixed" phones are cordless; some mobile phones can use fixed infrastructure, for example, through unlicensed mobile access (UMA); and telephony is available as a PC application delivered over a wireless local area network (WLAN). Most significantly, mobile networks are rising to the challenge of delivering voice over IP (VoIP) all the way to the handset, using the 3GPP IP multimedia subsystem (IMS) as the delivery infrastructure. Therefore, the case for finding a simple, unified solution is growing stronger with each new day.

The role of the core network entails finding, authenticating, charging, and managing the end-user. "Finding" is the key concept, because the main mission of the network is to provide reachability to any service or person, regardless of which network they are connected to.

The network also adapts, personalizes, and delivers content. The interplay between user, subscription, devices, bearers and media flows is extremely interesting, because this is where person-to-content (p2c) and person-to-person (p2p) services meet and meld. New approaches are being developed to fulfill the promise of new access technology without creating an unmanage-

BOX A, TERMS AND ABBREVIATIONS

3GPP	Third-generation Partnership Project
3GPP2	Third-generation Partnership Project 2
ADSL	Asynchronous digital subscriber line
CSCF	Call/session control function
CSMA/CD	Carrier sense multiple access/collision detection
DECT	Digital enhanced cordless telecommunications
EMA	Ericsson multi-activation
EMM	ENGINE multimedia
ETSI TISPAN	European Telecommunications Standards Institute – Telecoms-and-internet-converged services and protocols for advanced networks
HLR	Home location registry
HSDPA	High-speed downlink packet access
HSS	Home subscriber server
I-CSCF	Interrogating CSCF
IM	Instant messaging
IMS	IP multimedia subsystem
IM-SSF	IP multimedia service switching function
IP	Internet protocol
MGW	Media gateway
MRFC	Media resource function: control
MRFP	Media resource function: payload
MSC	Mobile switching center
O&M	Operation and maintenance
OSA	Open service access
p2c	Person-to-content
p2p	Person-to-person
P-CSCF	Proxy CSCF
PGM	Presence/group management
POC	Push to talk over cellular
PSTN	Public switched telephone network
RGW	Residential gateway
S-CSCF	Service CSCF
SIM	Security identity module
SIP	Session initiation protocol
SIP-AS	SIP application server
TTM	Time to market
USIS	User session and identity server
USM	User and service management
VoIP	Voice over IP
WiMAX	Worldwide interoperability for microwave access (IEEE 802.16 air interface standard for fixed broadband wireless access systems that employ point-to-multipoint architecture)

able tangle of options and restrictions for the end-user. Therefore, the two key value propositions for the IP multimedia subsystem (IMS) are really *enable* and *simplify*.

Network trends

Before we delve into some of the more technical issues, let us consider a number of market opportunities, some of which are already taking shape.

Two billion mobile handsets

Incredible ongoing growth in mobile handset numbers constitutes one of the most dramatic changes ever in telecommunications behavior. The mobile handset is rapidly becoming the communications device of choice: it provides mobility as well as personal expression. Mobile phone numbers do not identify a place but rather a person. We can thus use the device ID to capture, store and manage attributes that we typically associate with people.

One should also remember that communication occurs in many different contexts. Most people want to keep in touch with their inner circles of family and friends as well as with acquaintances, colleagues, business contacts, shops, companies they deal with as private customers, health ser-

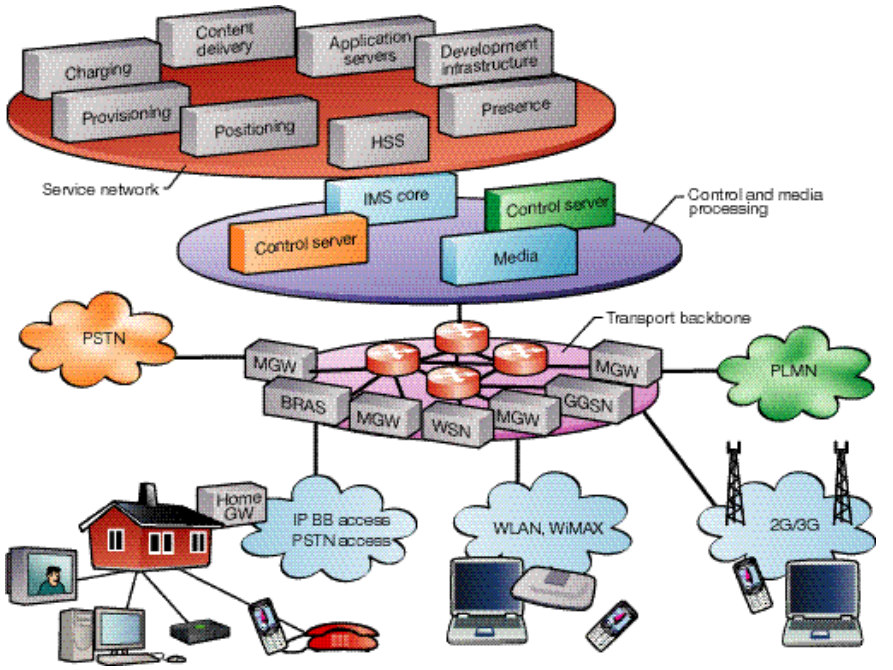


Figure 1
Target architecture.

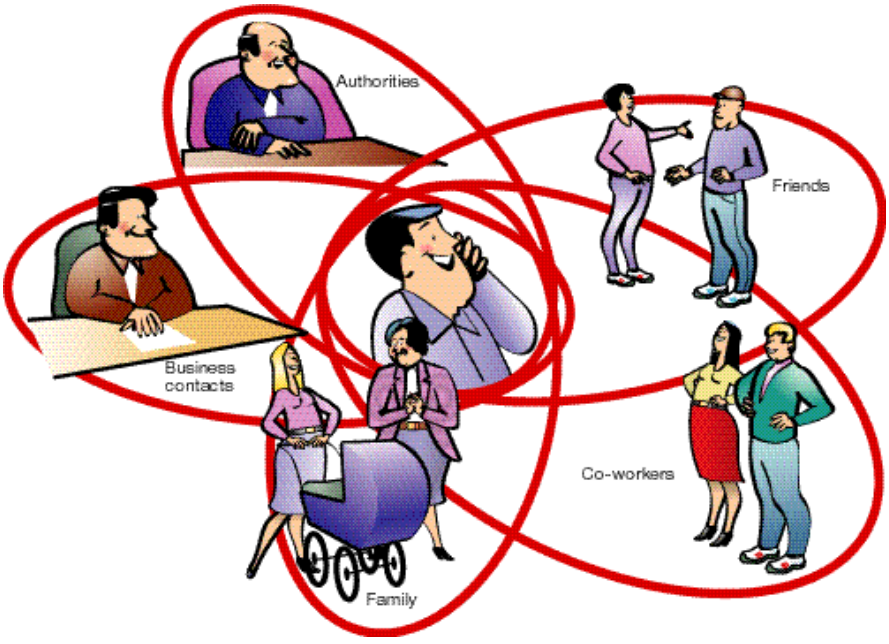


Figure 2
Circles of relationships.

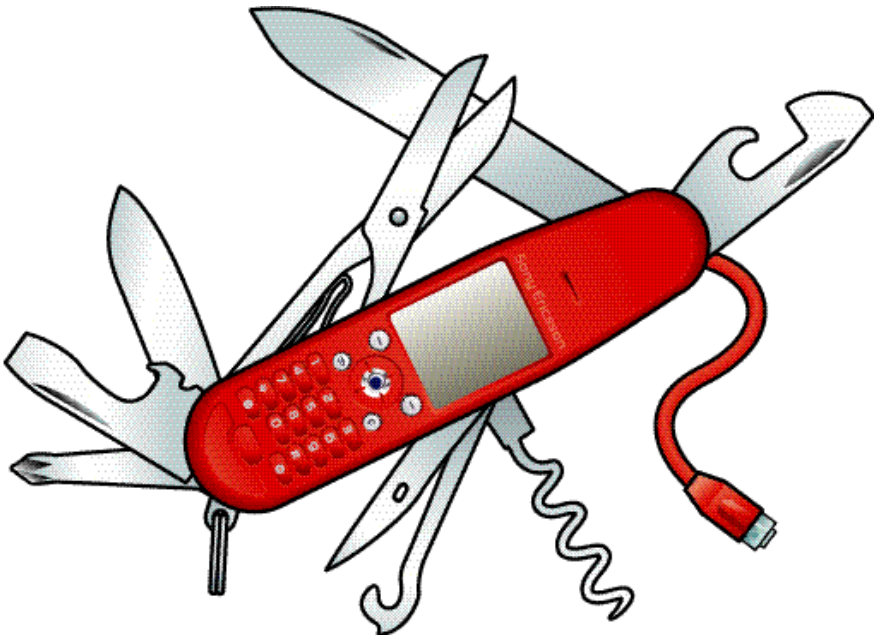


Figure 3
The mobile phone: the Swiss Army knife of the 21st Century?

vices, officials of various kinds, banks, and so on. Good communications solutions must thus manage these different contexts in a coherent and understandable fashion without trying to squeeze them all into one mold.

The mobile handset does more

A mobile handset is not merely a phone. It is a camera, a calendar, a music player, a radio, a note taker, a voice memo recorder, a game console, and a credit card. Indeed, it is just about anything you might carry in your pocket except possibly a comb. Many of the handset's capabilities can be used not only by themselves but also to enrich and even motivate communication.

This large a fleet of mobile handsets, however, is very diverse in terms of capabilities. Therefore, any strategy for service delivery must both cope with and hide the differences between devices. A key issue is to allow devices to negotiate (without user intervention) to manage these differences and deliver the best possible end-user experience.

Extending behavior

Time and again we are reminded of how difficult it is to teach the market to do something radically different. New services enjoy a higher degree of uptake and success when they are similar to what users already understand or use or when the services behave in a way that is consistent with previous user experience. Because they require very little end-user training, services of this kind spread quickly by word of mouth and simple concept marketing. As we shall see, this approach to introducing new services also benefits from the built-in presence, messaging, and media-management support in IMS.

VoIP over broadband

In recent years, broadband-based voice over IP (VoIP) moved from being a technical possibility to a market reality. Startups and incumbents have implemented first-, second- and third-line telephony services with considerable market impact. The main enablers have been increases in access performance (through xDSL and other technology) and computing performance. If access has already been paid for (flat monthly fee, for example) and the additional bandwidth requirements for supporting voice are minimal, then why not switch to VoIP? At present, this depends on whom you want to reach.

As mentioned above, different circles of communication behave differently. For instance, teenage friends will probably choose the same client supplier to set up an instant messaging (IM) group. Likewise, a user in Paris and her aunt in Buenos Aires can probably agree on which VoIP software to use, but what if the user wants to call her local health center? Even if the office runs a VoIP-enabled network, the call will probably be interconnected through the PSTN. But why go to 3kHz analog voice when the call is VoIP at both ends? The answer is security and network integrity. Interconnecting mission-critical IP networks over the general internet is not to be taken lightly in this age of viruses, worms and other forms of attacks. Accordingly, dealing with the interconnect issues is vitally important.

A key element is acknowledging that communications solutions are not created by protocols alone, but by careful development of architectures in which the protocols operate. It comes as no surprise then that the broadband world looks with considerable interest to the 3GPP IMS architecture for a

solid base for providing solutions to interconnect challenges. In particular, its appeal stems from its architectural support for security, authentication, authorization, charging, and scalability.

A matching trend on the device side (evidence that convenience and recognized behavior are important) is the VoIP handset. DECT-like phones are starting to appear that connect to a PC and not to a regular phone jack.

When comparing the situation for broadband VoIP with mobile multimedia, one should remember that the two scenarios have distinct side issues. In the fixed case, operators often see a transition to VoIP as a means of providing the same services at lower cost, effectively eliminating one or more transport networks while maintaining the impression for end-users that nothing has changed (Figure 4). The key functions, reliability, scalability and performance of the network solution must thus be equal to or exceed what it is replacing. The obvious next step is to move beyond classical telephony, for example, through better-quality codecs such as AMR-WB.

The mobile approach

Mobile multimedia, on the other hand, is primarily driven by the prospect of adding simplex or duplex media streams to conversations (voice, instant messaging, video telephony). This calls for entirely new devices, because mobile terminals are being asked to do much more than before. In other words, this is not about replacing telephony but enhancing it.

The main enabler for mobile multimedia is the rapidly increasing capability of handsets (in terms of processing power, display capabilities, memory capacity and improved battery lifetimes) to execute complex applications.[1] Downloadable applications (or as an interesting intermediate approach, sales-time-configurable devices) based on standardized runtime environments allow operators to profitably exploit a wide range of niche markets down to levels of penetration far below the mass market. Note that this scenario is only realistic if the amount of effort spent on a niche application can be concentrated entirely on the application domain as such; all surrounding paraphernalia (display management, address book management, configuration, reachability, multi-access, charging, and QoS) must be supported by standardized middleware, as is the case with IMS.

As we discussed in *Combinational services—The first pragmatic step toward all-IP*, a shortcut to introducing mobile multimedia services is to use existing circuit bearers to carry voice, and to run media extensions in the packet domain.[2] Since the publication of that article, significant progress has been made (with major contributions by Ericsson) in the 3GPP Combinational Services work item.

In a sense, the key feature of the mobile approach is personalization: the handset (or more specifically, the SIM card) is the anchor point that holds together the digital lifestyle. With the advent of SIP-enabled cordless phones, home handsets will begin to acquire the same levels of functionality as mobile phones. However, because wide area mobility is a significant requirement for the personal device, the logical way forward is for the mobile handset to acquire a new access link when in residential environments.

We have described the mobile scenario as a case of efficiently exploring many different service possibilities, but the real benefit comes when some of these services become major market successes. When this occurs, the operator must be able to scale up to mass-market dimensions (in terms of perfor-

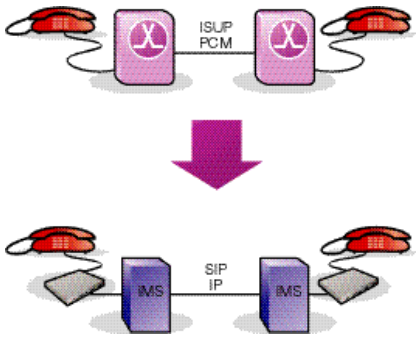


Figure 4
Replacing the switch: IAD+IMS.

Figure 5
Multi-service mobile phone.

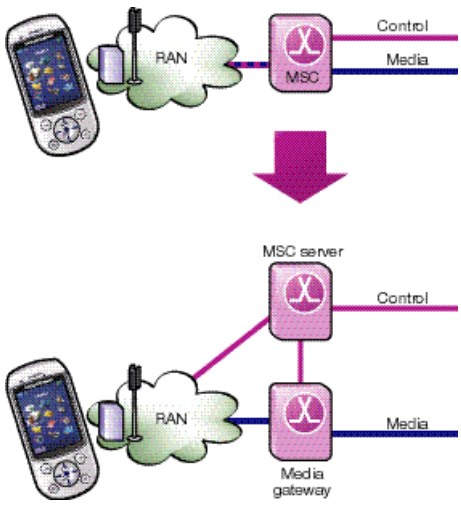


Figure 6
Simple layered architecture.

mance, coverage and reliability) without being forced into forklift upgrades or to change end-user behavior or equipment. Product planning and a good road map make Ericsson a business partner that operators can rely on

- to provide creative and dynamic support in the build-up phases; and
- to deliver full-scale solutions with professional support throughout the service lifecycle.

Network evolution

although it has been designed to be reasonably independent of access technology, IMS is not a solution in a vacuum. In particular, it has been preceded by a dramatic change in network topology—that is, the migration to a layered, core network architecture. Ericsson is a leading supplier of such networks, where the control element has been separated into servers, and the media plane is handled by dedicated media gateways (MGW). This architecture is a natural step toward IMS, because it provides a clear distinction between core elements and media-processing parts (Figure 6). In addition, voice transport over IP in the core network is already a feature in the Ericsson layered architecture. This means the networks are ready for

- an IP infrastructure; and
- interworking with VoIP networks in a smooth and planned fashion. Ericsson's MSC server, for example, can be deployed as an MGCF.

Architectural features of IMS

Reachability

IMS relies on SIP as its basic signaling mechanism.[3] At its core, SIP is a mechanism for

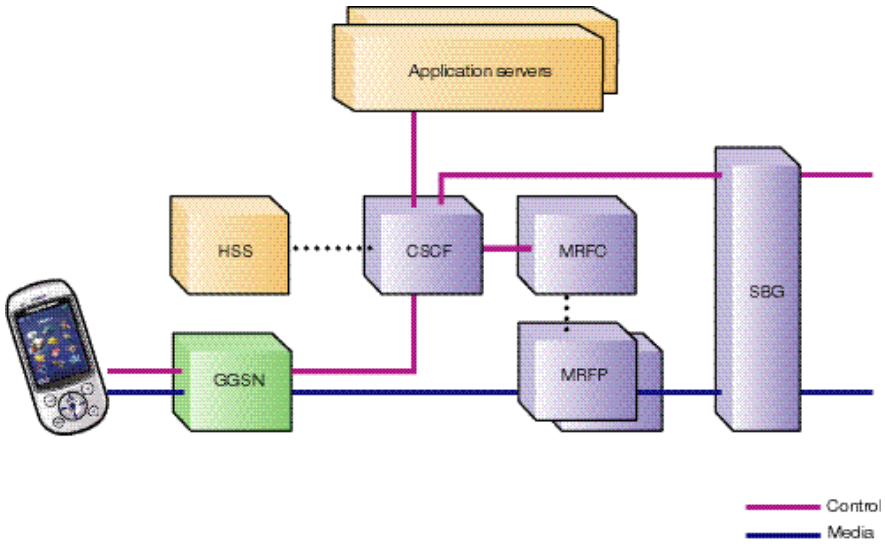


Figure 7
Key network elements of IMS.

finding and routing control signals between endpoints. The IMS architecture extends this concept by putting it into a framework of network elements that employ various SIP routing devices to fulfill different roles regarding service triggering, authentication and authorization, media plane resource invocation, network interconnect, topology hiding, scalability, resilience, and many other essential network properties (Figure 7).

Ericsson's IMS solution fully supports all IMS topology options. The basic call/session control function (CSCF) node, which in essence is the purest SIP server in the IMS architecture, can be configured for three different roles:

- Serving CSCF (S-CSCF): This node is responsible for maintaining network knowledge of an active terminal (excluding layer-2 mobility). This is where incoming session setup requests can be translated from the external identifier (sip:harry.potter@hogwarts.edu) to the node where the user wants to receive calls (room3.gryffindor.hogwarts.edu).
- Proxy CSCF (P-CSCF): This node is logically associated with access. The P-CSCF is one of the mechanisms that supports IMS network interconnect.
- Interrogating CSCF (I-CSCF): This node sits on the network border and provides a single point of entry (and exit) so that the network can scale and reconfigure without exposing its internal topology.

User management

A feature of IMS that turns it into the "missing link" between existing networks and all-IP is that it has been designed from the ground up to integrate into the existing mobile infrastructure. It does so by relying on the home subscriber server (HSS, including the HLR) to provide subscriber information, and the security identity module (SIM) card to assist in verifying the end-user, device, charging, media gateways, and signaling gateways.

Ericsson's solution applies the integrated user-and-service management (USM) concept to make the most of this potential. Among other things, USM links several components in a powerful combination:

- the HSS, which comprises 2G/3G HLR (providing the basis for reliable and scalable mass-market services) and HSR (providing support for new user data interfaces);
- user session and identity server (USIS), which provides single sign-on functionality to the service layer integrated into the connectivity system;
- the charging system, which provides support for pre- and post-payment schemes for every service; and
- Ericsson multi-activation (EMA), which provides a common subscriber administration interface to every affected network element.

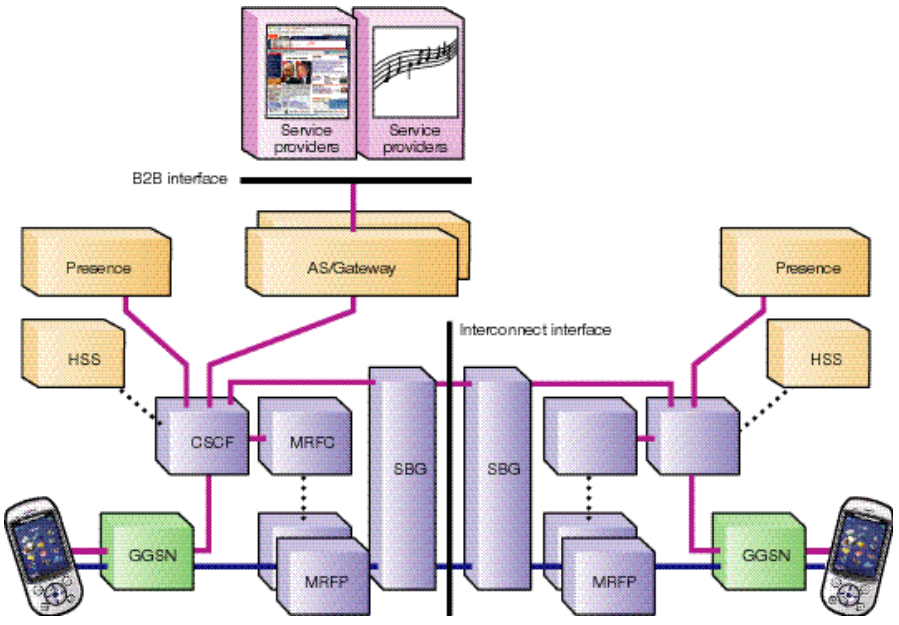
Merging SIP with the 3GPP network architecture (which supports security, reliability and realistic business models) results in truly multi-access, single-control, multi-service communications.

Services

As we have said, IMS is built on the session initiation protocol (SIP)—the core signaling protocol for all-IP. Therefore, IMS is basically about creating logical connections between peers that can execute session functionality end-to-end. But because the basic notion is to extend the behavior of telephony into a multimedia environment, network involvement is inevitable. Several call setup services, for example, are most efficiently handled by the network. An obvious example is *call forwarding on not reachable*.

Similarly, mid-call services (such as the invocation of multiparty bridges) require the use of network-based media plane re-

Figure 8
Person-to-person (p2p) and person-to-content (p2c) in the same infrastructure.

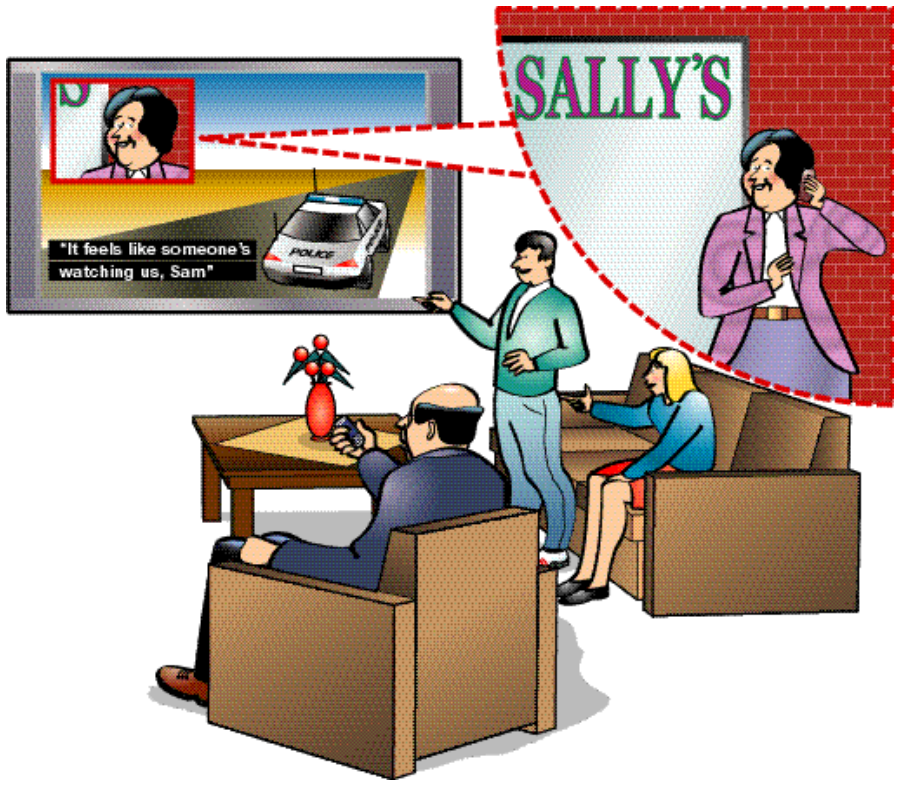


sources. Because these behaviors extend to the multimedia experience, the model includes

- the ability to invoke user-dependent originating and terminating services (triggers stored in the HSR and delivered to the S-CSCF at registration);
- the ability to analyze and, if appropriate, modify session control signals (in the various forms of available application servers: SIP-AS, OSA/Parlay gateway, IM-SSF);
- media plane resources (MRFP); and
- control of the media plane resources (MRFC).

An interesting example is a telephony application server, which performs the core call-management functions of the MSC. However, whereas the MSC was previously a single node, in the IMS network it is replaced by the cooperation of several nodes: application server, CSCF, MRFC and MRFP. The media gateway control function (MGCF) and media gateway nodes handle interworking with classical fixed and mobile circuit-switched networks. Ericsson has integrated support for this interworking scenario into its softswitch solution.

Figure 9
The vision: fully integrated communication.



Finally, the session border gateway (SBG) is rapidly becoming a key network element. The SBG protects network resources and subscribers by

- ensuring that traffic is from authorized sources; and
- controlling traffic flow characteristics.

To start small and expand with traffic growth, operators can co-locate combinations of the logical nodes described above on a single physical platform. This way, Ericsson supports efficient and scalable deployment from market trials to mass-market scenarios.

Person-to-person vs. person-to-content

As mentioned above, Ericsson's approach integrates user and session management both for person-to-person communication (building on telephony behavior) and person-to-content services (whose origins are in classical browsing, mail access, and so on). This latter aspect is changing in several interesting ways. Given that mobile devices are used increasingly as the user interface, it makes sense to have the initiative on the content side instead of with the user. In other words, targeted, situation-dependent information and advertising (content push) are becoming a valid approach. From this follows an interesting insight: the asynchronous delivery of content to an end-user is similar to requesting a person-to-person session for that user. IMS thus integrates

- fixed and mobile access; and
- telephony and the World Wide Web.

Interestingly, a common need to manage device capability information also drives the convergence of person-to-person and person-to-content communication. For applications to execute successfully, in the sense that the user gets what can be reasonably expected under the given circumstances, the applications must have access to various kinds of attribute information, such as

- bearer (current and potential);
- device;
- subscription;
- user preferences;
- roaming restrictions; and
- network conditions.

Again, it is essential that the attribute-sharing mechanism supports terminal- and network-based applications, including network applications that execute in the network of a third-party service provider. Also,

these attribute-sharing mechanisms must be subjected to privacy restrictions, under user control and fully auditable. The 3GPP IMS presence architecture provides a very useful base for supporting attribute sharing; therefore, Ericsson's presence/group-management products, coupled to the session-management capabilities of IMS, are a vital part of the overall architecture.

Home network

Session control, a key feature of IMS, is firmly rooted in the home network. This means that the operator (the prime focus of trust for end-users) is in full control of providing network security and protecting end-users. IP-based multimedia services are a potentially tempting target for various kinds of unwanted activities, such as denial-of-service attacks, instant messaging and telephony spam, virus and worm proliferation, and quality-of-service (QoS) fraud. In all likelihood, security will become a determining factor for attracting and retaining end-users. The IMS architecture gives operators a means of implementing perimeter and core defense strategies.

As an added benefit, by focusing service execution on the home network, operators who want to deploy new services need not wait for roaming partners to add similar support.

Radio access

We have thus far concentrated on the unifying properties of the control layer. A critical component, however, is the evolution of available forms of access. Rapid developments on the fixed side have brought ADSL2+ and beyond. Likewise, on the wireless side, we will see the introduction of high-speed downlink packet access (HSDPA) this year. And in related fields, WiMAX and similar initiatives provide interesting solutions for wireless scenarios that do not need the convenience of full wide-area mobility. Each of these developments points to an emerging field where telephony and multimedia services are increasingly based on IP solutions.

To show that the critical issues are under control from a technical perspective, Ericsson Research has implemented and demonstrated a SIP-based VoIP client on commercial telephone platforms: the Sony Ericsson Z1010 and V800. Therefore for Ericsson and its customers, the real issue is now to demonstrate technology leadership by actively exploiting available capabilities. This is a continuous process of identifying and taking the steps necessary to move from the current state of affairs to fully deployed, efficient, wireless IP-based multimedia services. As usual, this work is best performed by trials and soft launches together with operators who want to be in the driver's seat when exploring the potential of new technology.

Residential opportunity

What about communication to the home? Will it be replaced by mobile phones? Taking hints from markets in North America, Asia and Western Europe, the home is rapidly becoming a wired and wireless network-enabled environment. Converged media delivery solutions (triple play) make a single, QoS-enabled broadband connection a compelling alternative. However, this calls for intelligent termination and routing of service delivery to the appropriate device on the home network, depending on personal preferences, device capabilities, physical location, and so on. Likewise, it calls for device intelligence like that in mobile phones. One might argue that this can be executed in a home PC, but the need for 24-hour, 7-days-a week (24x7) availability, stability, virus protection, and so forth, strongly suggests the need for a residential gateway (RGW).

An access and service anchor point of this kind gives operators an excellent point of control. From the end-user perspective, it provides a clear point of responsibility. The introduction of a residential gateway as an IMS user agent for managing the home network immediately yields the same high level of application support in the home as is being developed for the wireless world. Apart from obvious economy-of-scale benefits, there is potential to create end-user services that exploit the full benefits of fixed-mobile convergence. In particular because it is an excellent platform for interaction with the personal device (mobile phone) and all other communications and entertainment-oriented devices in the home, ensuring a convenient and efficient end-user experience.

Open hardware and software modules

The IMS architecture is generally described in terms of logical network elements. The architecture has been designed to give flexibility in many dimensions, including scalability, topology hiding, and service implementation. When you combine these fea-

tures, it becomes clear that the implementation strategy cannot be based on mapping the architecture to boxes. Instead, one should base the design on a set of software and hardware components placed in an architectural framework. Ericsson already delivers collapsed IMS configurations in which many of the logical nodes coexist on a single platform. For a high-capacity network, the configurations can instead be delivered as separate nodes. In its role as market leader, Ericsson provides solutions which support early launch, low-threshold configurations that are cost-effective in the low end of the spectrum. Later, these can be scaled up to high-performance, high-capacity configurations for true mass-market applications.

Ericsson is making it possible to use common hardware for MSC servers and IMS servers. To operators this means greater flexibility and a broader range of growth options. Resources deployed in the classical architecture can thus later be moved to the IMS domain when multimedia traffic volumes take off.

Elsewhere in this issue you can read about the Integrated Site (IS) concept. IS fits the all-IP story nicely because it packages and integrates the entire IP infrastructure in a coherent and scalable fashion.[4]

IMS introduction and VoIP

IMS VoIP over mobile bearers

Why not try VoIP over existing bearers? Ericsson has already run trials to give operators experience of IMS and SIP-based services. The trials provide invaluable feedback, both from a user perspective and from a network planning and utilization standpoint. They also help identify issues that need further consideration before fully IP-based solutions can be launched for the mass-market.

Operators who have taken part in the trials are positioning themselves as leaders and initiators in this important emerging field. As mentioned above, the terminal prototype was implemented on commercial telephones from Sony Ericsson.

These efforts currently use existing dedicated and best-effort 3G bearers. At the same time, Ericsson is very active in creating new bearers: high-speed downlink packet access (HSDPA) and its uplink cousin. These improve 3G performance in many ways. Of special importance for the introduction of VoIP service is reduced round-trip delay and greater overall cell capacity. Similiar trials (with similar encouraging results) are being made using EDGE, ensuring a complete and consistent VoIP delivery scenario.

Push to talk

From a mobile perspective, the implementation of IMS can start today with services such as IMS-based Push to talk over Cellular (PoC), which offers feature-rich person-to-person and group communications, chat rooms, personal alerts and presence-management services.[5] PoC operates entirely in the packet-switched domain and is based on common IMS service enablers and infrastructure, such as group, list and presence management, multi-party conferencing, security, charging and O&M.

This way multimedia services are introduced using common IMS infrastructure and service enablers, including a VoIP component. Initially, this component will be based on available packet bearers (interactive and streaming), providing a good enough voice component experience for the end-user over mobile access. One can expect carrier-grade voice from access forms that can be overprovisioned economically.

The advantage of this approach is that most of the main IMS architecture elements are already in place, including a rich set of the required infrastructure and service enablers. Operators may thus implement a real-time mass-market VoIP solution in service-driven, business-motivated steps. They also gain an early route to fixed-mobile convergence without the need for architectural changes.

weShare

As mentioned above, combinational services give operators a head start for introducing multimedia services. As a consequence, every packet-side service element and infrastructure resource created in a weShare context remains valid and useful even when the voice part moves to VoIP technology. In fact, even the end-user GUI can remain the same. The attribute-sharing infrastructure introduced with combinational services is an indispensable feature for the evolving network architecture. This solves the problem of managing the complexity of hundreds of terminal types, thousands of services and a wide range of access options.

VoIP over WLAN

SIP-based VoIP telephony is becoming available over wired Ethernet infrastructures, for example, using Ericsson's IMS-based solutions (EMM). Extending 802.3 (wired) solutions to 802.11 (wireless) is fairly straightforward, because the solutions share layer-2 addressing and networking principles. But because the transmission medium has different properties compared with classical Ethernet carrier sense multiple access/collision detection (CSMA/CD), full deployment requires careful network dimensioning, including perhaps the deployment of quality-of-service (QoS) mechanisms and admission control policies.

IMS-CS interworking

In the meantime, some operators want to integrate broadband VoIP access with the ability to fall back to mobile voice when out of WLAN coverage. This will considerably ease the introduction of VoIP services, because operators can rely on established infrastructure to provide service continuity with wide area coverage.

IMS VoIP: the endgame

The real prize consists of a fully homogeneous, IP-based environment for every service element. The goal is control, non-real-time payload, and real-time flows in a single integrated delivery architecture.

IMS and the associated capabilities of the service layer provide the common machinery for access-neutral control, but what about radio? Rest assured that Ericsson is leading the way in providing this final component. Ongoing improvements to the 3G bearer (HSDPA, enhanced uplink) are creating a performance scenario that makes fully commercial wide-area mobile VoIP solutions economically feasible.[6] In addition, new bearers are now being designed to better map to "classical" fixed-line IP bearers. This facilitates the design and deployment of QoS mechanisms that work across a wide range of fixed and wireless access forms.

Summary

The benefits of a unified approach can be summarized as follows:

- IMS is built on the positive identification of end-users. No communication can enter or leave the network without being associated with authenticated and authorized control signaling.
- The use of IP as the sole delivery vehicle enables common bearer management and a unified control infrastructure. In essence, IMS does for session control what IP did for connectivity: anything on IMS, IMS on anything.
- Every party and standard can converge on the IMS architecture: the fixed world through European Telecommunications Standards Institute telecoms-and-internet-converged services and protocols for advanced networks (ETSI TISPAN); and the wireless world through 3GPP, 3GPP2, and the content-delivery industry.
- Services need not settle for the lowest common denominator in order to accommodate multi-access. Instead, applications will be able to negotiate the best end-user experience available, even in very dynamic circumstances.
- IMS is truly future-proof with regards to the addition of new devices, new bearers, and new applications.
- The key issue when considering time to market (TTM) is the time and cost of developing service *n+1*, not just the initial service.
- Because much of the infrastructure—user management, service management, bearer implementation, identity management, and charging—can be shared across a wide range of applications, the same OAM and customer care training and procedures apply.
- Ericsson has already demonstrated VoIP delivery over 3G bearers on the system side (IMS, WCDMA) and on the terminal side (Z1010 and V800).

Conclusion

Ericsson is a key player in taking communications forward to a network architecture that sees no artificial boundaries between access methods. The architecture accommodates many different radio and wired technologies and allows a wide range of network- and terminal-based applications to be deployed efficiently over any access. It also uses each access to the best of its abilities. Most importantly, it focuses on a single control architecture: IMS.

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