taking the soft option

Softswitch technology is revolutionising the fixed-line world by putting service creation technology into the hands of end-users. How will it fare in the wireless environment?

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Recently the fixed-line world has experienced a strange dislocation – many corporate telecom users are slowly becoming independent of both service vendor and network operator. What this means in practice is that enterprise-based users now have the freedom to create bespoke services that suit their needs, rather than having to buy over-specified services from operators.

This revolution has been brought about by the softswitch – a server that, using Java, allows users to build powerful and useful telephony applications that are independent of a network operator's proprietary equipment. And they can accomplish this without any knowledge of the black art of 'how telecom networks work'.

It should be stressed that softswitch is a term that is applied to a broad range of products – at last count there were almost 200 – so any definition tends to be either overly specific or loosely generic. However, softswitch technology is becoming increasingly important in the cellular market, primarily because it promises rapid and cost-effective service deployment. With time to market and funding such key issues for operators seeking to carve out market share in the data market, it seems the right moment to take a high level look at a promising innovation.

Very broadly, what a softswitch actually does is separate call control functions from the transport layer and media gateways that carry it. The call control functionality – the mechanism that allows you to set up and tear down sessions, handle call routing and so on – can be held on a server as software and controls what you do with the call, while the network operator's equipment handles the getting-the-call-there part of the process.

A softswitch can reside on top of media gateways, in other intelligent networks (IN) or can be used remotely from both. The key point is that call control and transport functions are kept separate. At least that's the theory. The practice also involves putting together what is known as a 'service creation environment' that sits on the softswitch and allows developers to build telecom services with a simple mouse click. The service creation environment – also known as a 'feature creation environment' – provides a Java-based graphical user interface (GUI) on top of the softswitch and media gateway, allowing users to create new services quickly and easily by dragging and dropping service elements.

For example, should someone wish to build a calling-card service they select the Java bean that controls the software for calling-card call recognition; then link it to the next bean that gives out the 'enter card number' message; and then link to the bean that enables the

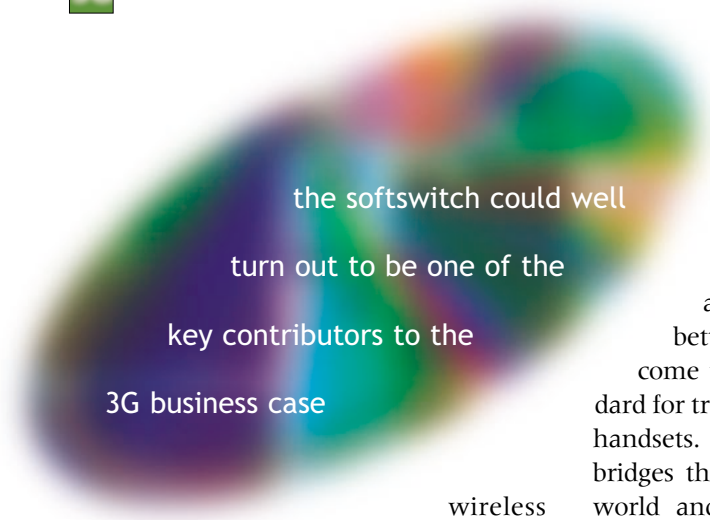


call. A few swift mouse clicks and the service has been created.

The softswitch concept has already proved to be an embryonic success in the wireline arena. It allows third parties and re-sellers to develop new and useful services and bring them to market cheaply and, above all, rapidly. For example, a business can now adopt a hosted telephony model, avoiding the high costs of buying an upmarket PBX by effectively outsourcing advanced functionality – like viewing missed calls, click to dial etc – to a third party. Which perhaps helps explain why the solution is now attracting a great deal of interest in the wireless world. In the 3G service environment, the softswitch solution has an important role to play enabling third party content and even service providers to enter the mobile value chain.

As it has started to do in the fixed market, the softswitch concept can also be brought to bear on wireless – allowing efficient and relatively inexpensive services to be delivered quickly. In the early days of rollout, the softswitch could well turn out to be one of the key contributors to the 3G business case. Assuming, that is, the industry can find a way around the hurdles currently troubling developers.

Running a wireline softswitch solution is simpler than running its ▷



wireless counterpart. While the softswitch principle is clear and effective in the context of a fixed network, wireless has the inherent problem of hand-offs between reception cells as the user moves around. These handovers require complex protocols, functions and application delivery mechanisms to make the concept work. While there has been a great buzz around softswitches in the mobile community, standards and applications do seem set to take a lot longer to come to fruition.

The other significant barrier that stands between concept and delivery is WAP. For better or worse, WAP has become the widely adopted standard for transmitting applications to handsets. In essence, the protocol bridges the gap between the fixed world and the wireless world; it allows applications that run in a fixed arena to run on a wireless handset. This means that all the issues of 'inter-softswitch interoperability' have suddenly become a great deal more complicated.

In the fixed softswitch world there are some 20-30 softswitch vendors and a number of significant interoperability issues. To address this problem, the International Softswitch Consortium (ISC) – a group of over 100 IT, telecom and networking equipment suppliers – has adopted a standard called session initiation protocol (SIP). This protocol allows different types of softswitches and gateways to talk to one another – essential if all the users of the new technology are to talk to everyone else in the same way that the old technology allowed. Additionally the ISC has also opened a member-funded interoperability test lab in California, providing an open forum for testing different combinations of vendors' products.

But many developers – including some in the ISC itself – see SIP as a stopgap solution. This is underlined by the fact that most describe it as a protocol rather than an application programmable interface (API). For true APIs, a good proportion of the industry is looking to Parlay and Java advanced intelligent network (JAIN) as the key to genuine openness between different open systems. However, these two APIs have their own committees of standards developers and it is likely to be at least two years before these come to fruition.

So we must assume that in the short term we are stuck with SIP. This means that, as users move from cell to cell, the wireless industry faces the problem of sending applications to handsets using some sort of SIP to WAP (SWAP – I kid you not) technology. To make this possible, all the source code must be written in WML or a proprietary language like Lingo. On the positive side, the beauty of Lingo is that it is platform independent and can work on any softswitch platform, be it wireless or wireline. It can also be used with DSL or cable and indeed with 2G, 2.5G and 3G wireless.

But it is with SWAP that real progress is being made right now. A SWAP gateway, for example, can allow SIP to open up WAP and show who is calling on a PC screen

The case for SIP

Making packet switch networks — IP networks to all intents and purpose - work means making sure that calls can be set up, kept up and torn down when finished.

As always there is more than one set of standards emerging to facilitate this - session initiation protocol (SIP) and H.323.

H.323 is the International Telecommunications Union (ITU)'s set of standards that specify how real-time multimedia IP calls actually work. As a standard it is being taken up very rapidly, but not all those in the industry think that it is the way forward.

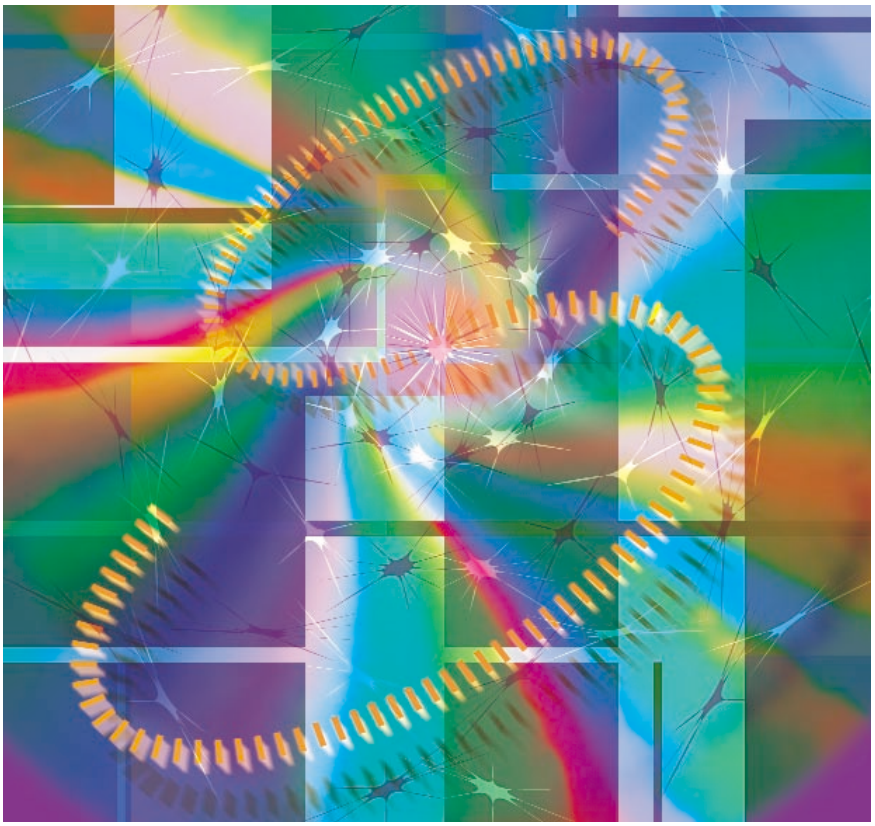
Many of those that seem most uncertain about the ITU solution are involved in integrating softswitches into the wireless world. Most of these developers have opted for SIP, which is the IETF's preferred standard for multimedia communications control. Simply put, SIP uses text messaging to set up and maintain IP sessions over IP networks. It is widely considered to be much easier to implement, much faster to run and much more scaleable than H.323.

For those of a technical persuasion, SIP is a layer 7 (application layer) protocol and it makes sure the compression and transmission algorithms for different media transmissions over the same network are set up correctly at the start and end points of the transmission. This can greatly reduce the call set-up time compared with H.323, say the experts, as SIP is designed to support multicasting.

For this reason it is ideal for the softswitch model and is easier to use with other protocols to convert fixed IP-based signalling to that supporting WAP or other wireless applications.

and push or pull web pages without any physical connection between handset and PC. This means that it is no longer necessary to create a different version of the same application for every type of network that you are running.

An example where this process might be used is in ordering pizza using a mobile device. As you call the pizza delivery shop, the shop's menu pops up on your screen in all its full colour glory. There is no converting HTML to WML and ending up with a very poor imitation of the website on the laptop screen or on your phone. The two work side by side. Coupling this with Bluetooth and SWAP allows users to swap WAP messages between phones and between devices. In this way remote users can, through a WAP/SIP combination, integrate with their main office systems and enjoy a rich media environment using exactly the same technology that has liberated them from the office.



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But a word of warning – such functionality will not necessarily just be offered by a network operator. Such a service might well be delivered via an ISP or by the enterprise itself. Companies like IP voice service provider BeVocal use Java and VoiceXML to create weather, stock market and other information services that it can push over any network, wireless or wireline.

What this really means is that softswitches can reach their true potential if they can embrace the wireless world. This is because a softswitch facilitates service creation. The delivery channel is becoming increasingly flexible. What is more, the delivery channel for services is increasingly being dictated by the end users' demands and locations. What softswitch vendors, service providers and network operators must do is embrace the idea of converged communications, not just as voice and data on a single network, but all services on any network. And that means adding wireless.

Softswitches allow the creation of services. Getting all networks to talk to one another means that such services can truly reward users. Take Ubiquity's 'share the moment' idea that is being looked at by Fedex in North America. Ubiquity's vice president and general manager, Martin Sendyk, explains: 'My mom lives in Calgary, Alberta and I live in Ottawa. I buy her a gift and Fedex has a 'share the moment' service that costs $5. I pay my $5 and, when my mom gets the gift, a signal is sent that activates a softswitch application that calls me. If I am not in my office, it checks my PC calendar to see where I am. With call control via SIP, it gets my cell phone and I share the moment with my mom as she opens the gift.'

A touch sentimental, perhaps, but I'm sure you can all come up with your own tough-minded applications. What this example is meant to demonstrate is that once you uncouple the applications and the services and allow third parties to develop applications, the world of electronic and mobile internet-based services will explode with innovation aimed squarely at end users. And the softswitch is one of the key technologies that can make this happen. □

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