No 1, May 2007

IPL telecasting

The IPL telecoms & broadcast newsletter

Burst transmissions

Mobile TV, or not

The industry is on the edge of its collective seat. Mobile TV offers network operators the chance to bypass Metcalf's law, which user-to-user mobile video failed to overcome, and to increase ARPU by selling the privilege of watching clips from Friends or Big Brother. There are plenty of delivery technologies including DMB, DAB, DVB-T, DVB-H, MediaFLO, MBMS and WCDMA-TD. There are so many to choose from, but none of them is without problems. The service trials so far have suggested only slight to moderate user enthusiasm. Is that going to be enough to lure anybody into a mass market deployment?

Femtocells

ip.access and others have started to offer femtocells, at least at the clay model stage. While microcells, nanocells or picocells (the terms seem to be bandied indiscriminately) have been targeted at a fairly small corporate market, femtocells address the mass market. The idea is that a licensed GSM network operator puts a small GSM base station into the customer's home. The base station is backhauled to the HPLMN via IP over the customer's domestic wireline broadband. Like BT's Fusion, this could use GRA signalling; unlike the Fusion offering (which use Bluetooth or Wi-Fi), the femtocellular phone only needs a single radio layer interface: 3G. For the operator it offers the chance of developing its fixed-mobile substitution by offering discounted calls when on the home cell, and free extension of its network coverage (so that visitors to the home can use the GSM cell, but at normal rates). It could be next year's easy winner.

3G Long Term Evolution (LTE)

Now that HSxPA is rolling out, the radio layer people are talking up LTE. The emerging 3GSM release 8 standards stream proposes using MIMO and OFDM (like WiMAX) to offer download rates of up to 100Mbps. LTE may be available for deployment by 2010-2015, by which time the expiry dates for the current 3G licences in Europe will be in sight. This is all very good, but will there really be sufficient user demand for high data rate applications?

Offshore without compromise

IPL has appointed Ness Technologies as its strategic offshore partner. As well as its experience and intellectual property in OSS, call centres and XoIP, Ness brings IPL massive increase in capacity and reach, with 7,500 employees and operations in 16 countries. IPL now offers access to low cost offshore testing and development services, under IPL's famously strict technical management, and so without the problems of direct offshoring.

Out of the sandpit

IPL's enthusiasm for MySQL as an industrial strength database platform grows. IPL teams have successfully used MySQL for business-critical work, including designing a large real time and network critical service database for a global network operator. IPL's Dave Shepherd made a big hit recounting some of our MySQL war stories at the 2007 MySQL Conference, and we're now officially a MySQL Gold Partner.

No elephant in our front room

At the 3GSM conference in February, Vodafone's CEO Arun Sarin is reported to have expressed concern about WiMAX as a threat to GSM. ''WiMAX is the elephant in the front room'', he said. From the UK perspective, with WiMAX constrained by Ofcom's spectrum licensing, that seems overly dramatic.

Conspicuous, on the other hand, by its absence was mention of xMax technology, even though it's rumoured that somewhere in the USA a carrier scale xMax network is being built. Is xMax patent nonsense and beneath the GSM operators' contempt, or is it too terrifyingly good for them to admit to?

MVNO Enablers

IPL is increasingly confident about the future of MVNOs as a channel for network operators to reach specialized market segments. An example is Omego, "The mobile phone for kids". Reflecting this confidence we have formed a partnership with Piran Partners (MVNO experts) whose Virtual Partner Programme enables operators to define and improve their wholesale strategy, systems and processes. IPL has been doing a good deal of MVNO enabler (MVNE) technology development, focusing mostly on prepay charging systems. For software that handles real money, you need a reliable partner like IPL.

IPL telecoms foundation

IPL now offers its own telecoms foundation course to the public. The two-day course presents a very broad synopsis of current telecoms technologies, in the context of the telecoms market and of telco business processes. The course is primarily for people with a general IT background who wish to work with telecoms technology, or in telecoms businesses. For more information contact clive.tomlinson@ipl.com

What's this?

- Welcome to IPL's newsletter for telecoms and broadcast businesses.
- As one of the UK' s leading software houses serving this converged industry, we're well placed to report on what's going on.
- Our newsletter offers industry news and opinion, and reviews some of IPL's most interesting recent projects.
- We're in free-ranging and conversational mode here. We hope you enjoy it, and we'll welcome feedback from you.

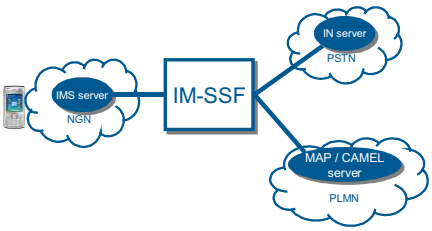
Inside...

Coordinating SIP, IMS and IN

Integrating with the IP Multimedia Subsystem

Telecoms network operators are reducing their operating costs, and offering better integrated voice and data services, by migrating their networks to Next Generation Network technology. NGNs are based on Internet Protocol, Session Initiation Protocol and the IP Multimedia Subsystem network architecture. Migration to IMS will take some years, and so IMS systems will have to interwork with legacy Intelligent Networks and GSM core network systems.

The vital interworking function is identified in the IMS architecture as the IP Multimedia Service Switching Function (IM-SSF). The IM-SSF has to translate between SIP family protocols in IMS networks, INAP protocols in fixed networks, MAP in GSM mobile networks, and CAP in CAMEL roaming networks.

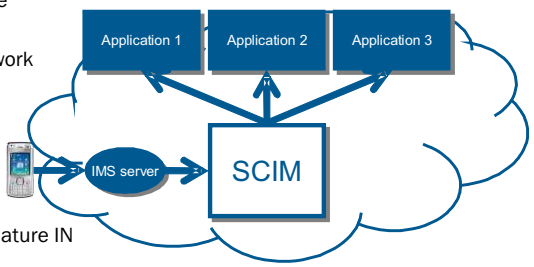


Coordinating network applications

Also, as telecoms service providers offer increasingly rich portfolios of value-added services, the problem of managing interactions between services grows. In the IMS architecture, the challenges of passing network events to the correct service applications, of sequencing multiple applications that serve a single network event, and of resolving contention between service applications, are allocated to a component called the Service Capability Interaction Manager (SCIM). Similar challenges have to be addressed in the more mature IN architecture.

From the technical perspective, SCIM acts as a broker, accepting trigger events from the network (for example, at call setup time), and then interacting and arbitrating between multiple applications throughout the call. SCIM controls the order of application invocation, whether invoked sequentially or simultaneously, and arbitration between application responses before providing a consolidated response to the network. Network operators can use SCIM to ensure safe interoperation of their network features.

IPL has great depth of experience in developing core network applications, originally for the IN world and now in IMS. In particular IPL has up to date expertise in developing application sequencing functions and application protocol interworking



gateways, including SIP, CAMEL and INAP. Our software is embedded in a number of leading vendors' technologies. Our business development consultants (details on the back page) will be happy to tell you more.

Limited coverage

For long enough, network operators have been trying to crack the problem of monitoring their users' experience. As the magic of network connectivity has become ordinary, and quality of network service has risen generally to the point where quality problems are not a significant issue, network operators are struggling to invent differentiating features. Adding new network services usually requires large infrastructure investments and the return is often poor. Customers want to make two-party voice calls, access the Internet, and send messages. Once a network offers those facilities, uptake on incremental network services has been weak.

In this context, offering service management features to network customers begins to look attractive. Service management facilities can often be added with relatively small investment and without disruption to existing services. In particular, service quality monitoring facilities can do a lot to make a merely average network look attractive. While most networks offer technically good service, a network that can persistently show its customers how good it is has a significant market advantage.

Customer network service management has always been difficult. Why? Because before the operator can present service quality information to the customer, the operator has to have the information. What quality of service is a given customer, or a given user, actually receiving? Mostly, the network operators just don't know.

Customer service reporting was not a matter of much interest until the time when real competition arose between networks. Inconveniently, the competing networks were cellular wireless networks, where the relationship of user service to network equipment state was fluid. The network operators' knowledge of their service quality was limited to knowing which cells were working properly. The users, who could tell very easily what their service quality was like, had a huge information advantage over the operators.

What quality of service is a given customer, or a given user, actually receiving? Mostly, the network operators *just don't know*.

With 2G and 3G mobile networks there came more helpful signalling standards. It became possible to monitor signals at the RAN-core interface in sufficient depth to build a view of individual users' network connection quality, in terms of attach time, call setup time, proportion of calls prematurely released, and so on. The prospect of delivering a precis of this information to the customers, maybe even direct to their 'phones, became a lot brighter. Many network operators now offer rich and accurate voice service quality information to their corporate customers.

But soon after 2G, much of the market's attention shifted to data transports – GPRS, DSL, DOCSIS and others. Data services are enormously richer than voice services, and the simple measurements that so effectively can characterize a voice service, are next to useless for a data service. Measure the *raw data rate*: what does that tell you about the IP data rate? Measure the *IP network performance*: what does that tell you about the TCP performance, or the http performance? Not much – the relationships are too non linear. Measure *http performance*: you'll find that you're measuring somebody's web server performance as much as the network's. Measure *standard applications protocols A, B and C*: that tells you nothing about the nonstandard applications protocols that your customer's proprietary applications use. It tells you nothing about the traffic in closed protocols such as Skype. Measure *all the protocols you can think of*: how does that relate to the user's experience? There's a huge challenge out there, and the market will reward a good solution.

ETSI ETR 101 290: is that all that you want?

Maintaining the quality and reliability of a DVB broadcast service is critical to the network operators, to the content providers and to the service consumers. There are many tools that offer to help the operator to meet that goal. But how effective are they?

Tools are available for basic television broadcast monitoring, but they do not allow the network operators to see a complete picture of the services that they have to carry.

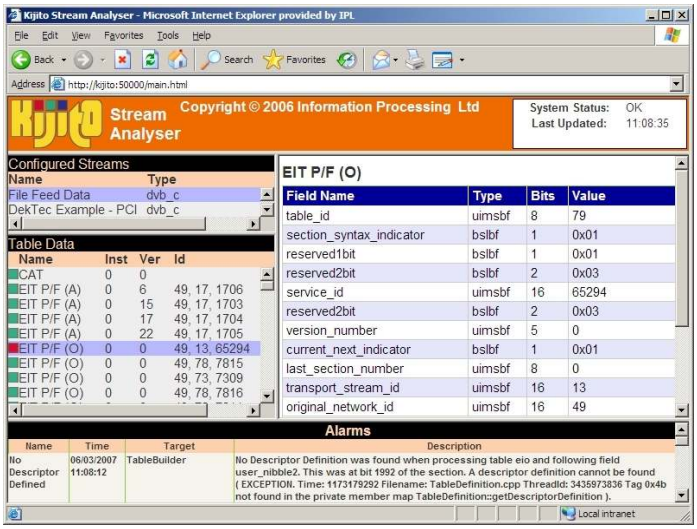
There are, for example, devices for automated qualitative monitoring of the audio and video components of an individual TV service. The old system, of engineers staring at banks of monitors, is becoming history.

There are also tools for making the ETSI TR 101 290 measurements that so many network operators choose to rely on. Virtually all industrial-strength transport stream analysers offer those measurements. However, in many cases, the tools are designed for tracing known faults. They are not dedicated monitoring systems, and the cost of deploying them to monitor an entire broadcast network would be exorbitant. Continuous ETSI TR 101 290 monitoring requires dedicated monitoring equipment.

So, a broadcast network operator can cover the basics: automatic monitoring of video, audio and ETSI TR 101 290 measurements. Is that enough? Is everything covered? Can they afford to leave it at that? No, no and no. There is a great gap of critically important but unmonitored information. That information is the stream metadata, for example the programme specific information tables which direct the IRD in its service decoding, and without which the broadcast network is useless.

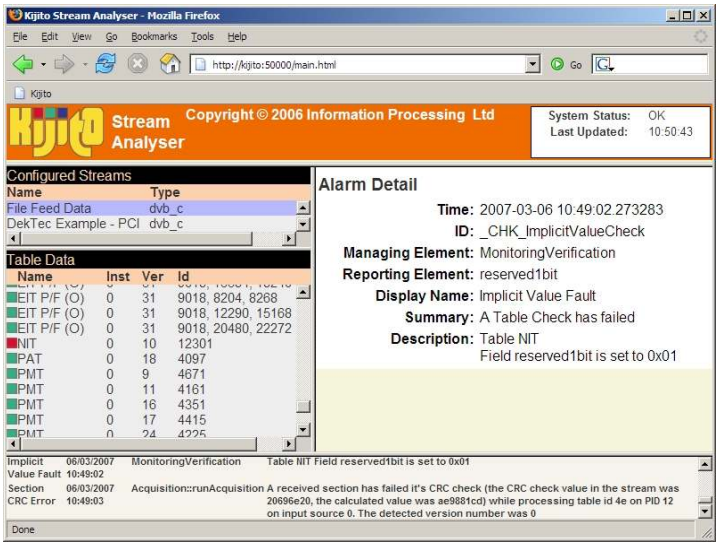
There are ETSI standards governing that metadata, including ETSI EN 300 468 and ETSI TR 101 211. In fact, it is from the latter standard that many of the ETSI TR 101 290 guidelines are derived. However, broadcast networks almost always carry broadcaster specific information which does not stay within the standards.

For the metadata to be valid, many relationships have to be maintained between its components. Those relationships can be between items on a single transport stream, or between items on different streams. If the metadata is wrong, then the broadcast service, however good its audio/video components, will be unusable when it gets to the customer's decoder. In fact, a fault in the metadata can wreck far more than a single service, and so can have far wider-reaching effects than an isolated audio or video fault. The results of metadata faults are typically a flood of calls to the broadcaster's call centre, followed by long lasting damage to the broadcaster's reputation. It cannot be sane, from either an engineering or a business perspective, to leave the metadata unmonitored.



> *If the metadata is wrong, then the broadcast service, however good its audio/video components, will be unusable when it gets to the customer's decoder.*

Why then do networks only trouble to monitor jitter, picture quality and packet formation? One reason is that there hasn't been an effective metadata analysis tool on the market. IPL has changed that. Bringing together its Telecoms and Broadcast sector network management skills, IPL has developed Kijito, a versatile transport stream monitor and analyser, capable of deployment economically throughout a broadcaster's network. It operates at a level above that of conventional broadcast analyzers, by interpreting and verifying the transport stream metadata. Kijito is configurable to meet the specific monitoring and analysis needs of a particular broadcaster and to support them as their network evolves.



Kijito supports 24x7 monitoring of multiple transport streams, reporting detected faults to a centralised Fault Management System using SNMP facilities. Capable of capturing streams of various formats (including off-air), it may be deployed at many points along the broadcast chain, which enables automated root cause analysis.

Kijito operates on commodity hardware, and configurations can be selected to suit the number of streams to be monitored, the level of verification required and the operating environment.

'Nic Newey, IPL

'Nic has worked for IPL for over twenty years as a communications software engineer and system architect. He has developed, supported and managed software technology for broadcast and telecommunications networks and their supporting fault and performance management systems. He works as a consultant to the Business Development team and as the product manager for IPL's broadcast network monitoring product, Kijito.

Backward Channel

Noisy signal

For untold ages, the ITU Telecom World jamboree was a forum where real business was done. Every four years we eagerly commuted to it, 75 miles from the nearest available bunkhouses. Then fixed-mobile substitution and XoIP began to nudge the wire line network operators towards the position of undifferentiated budget bit-carriers. The industry began to see Telecom World as bloated hollow nonsense, as the fixed carriers whistling in the dark. The focus of the real excitement, the real business, shifted to the GSM World Congress.

This year the 3GSM World Congress attracted both more exhibitors and more visitors than the ITU event. Highlights included the twiglike CBOSS dance team, and keynote speeches from the CEOs of two massive though perhaps anxious European GSM network operators. Anxious, maybe, because since the success of mobile voice calls and SMS in the 1990s, there hasn't been a single new network service to substantially increase ARPU. MMS and video calling have flopped (failing even to beguile the teen market), and ringtone downloads have been only a marginal earner. If the exhibition was big, it was because it was bloated with stalls offering fatuous trivia, in the hope that a network operator would mistake them for the Next Big Thing.

And where have all the content providers gone? It's content (often of a very particular kind) that provides the pull to bring emerging technologies to mass markets, and so the presence of a busy crowd of content aggregators at 3GSM 2006 augured well for mobile video. But the content area seemed much quieter at the 2007 event. Are the content businesses really less bullish about GSM, or are they just making less noise than before?

It's all going wrong. The World Congress has become a parody of a marketplace. With user base saturation approaching and margins decreasing, it's the GSM industry's turn to whistle in the dark. So next year, where will be the real excitement, the forum where the real business is done? I want to know, please! Somewhere where there are SIP application vendors, or IMS service operators, or WiFi network aggregators? Answers on a postcard to clive.tomlinson@ipl.com.

Predictive coding

First-world operators have a couple of remedies for their vexingly high customer churn rates. Already they're trying n-play service bundling, which may not increase ARPU, but certainly makes it more difficult for the customer to flit to a better deal elsewhere. Soon, we expect, operators will reduce or drop handset subsidies. Handset subsidies fuel churn by giving rival networks free eye-candy to offer in their store fronts. Now that MVNOs have shown that they can get customers with SIM-only services, the network operators are beginning to follow suit. Once handset subsidies are gone, the phone market may settle down to selling phones that people are prepared to pay for – simple black ones that do phone calls and SMS, perhaps.

It's much easier for network operators to make a profit in the developing world than elsewhere; they can install refined modern cheap kit, instead of the expensive old stuff that the first-world operators maintain. However, the end of subscriber base growth is nigh, and not just in the developed markets. Globally, subscriptions may reach 3 billion in 2007, but the very educated chaps at Informa tell us that growth is slowing and the 4 billion mark may not be reached until 2011.

While fixed network operators, led by BT, are committing to IMS as a route to offering services that span fixed and wireless networks, enthusiasm for IMS is not the immediate priority for the GSM operators. Why should they hurry to let go of the radio networks on which they've spent so much? In the long term, market pressure for network-agnostic mobility will drive IMS inexorably forward. But for the medium term, we guess that the GSM operators will go instead with GRA/UMA, and take a free ride on fixed networks' broadband links.

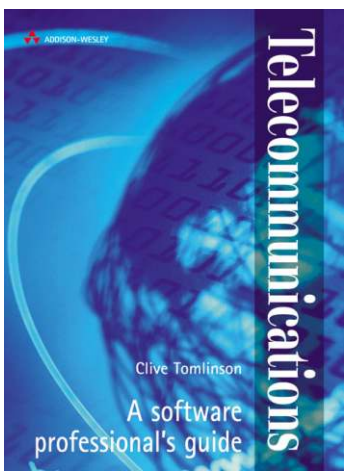
Jitter

HD scam

With the massive Christmas 2006 take up of HD-Ready TVs and Freeview set-top boxes, we should all be prepared for the forthcoming TV bonanza when new terrestrial HD services take-off. Or will we? No one in their right mind would broadcast HD content without using H.264 compression. But who's got a DTT set-top box that can decode it? OK, so you can simply buy another box, but what of your expensive HD-ready TV with integrated Freeview receiver? That will need a second H.264 decoder. HD and Freeview are in the mass market now, so it's not just the early adopters that will feel stung this time around.

"Non-fiction"

Addison-Wesley has just re-released Clive's airport blockbuster (ISBN 0201674734) using print-on-demand technology. Personal dedications are available from the author at no extra charge.



Access network

Unless you are already working with an IPL Delivery Manager, your first point of contact with IPL should be one of our business development consultants:

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Jez has a PhD for his fascinating work on *the visual pigments of deep-sea crustaceans*, is a cave diver and open water diving instructor.

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