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CONNECTIONS

Connections



The theme of this issue of *Connect-World Europe* is, *The evolving 'Net' - Rising to the challenge of rising use.*

The growth of the net, often in unexpected ways, is challenging capacity, search resources, regulations, security, equipment manufacturers, marketers, e-businesses – indeed, the entire Internet ecosystem. Where do we go?

Governments and regulators have a duty to both the sector and the consumer that is often difficult to reconcile. They need to find ways to use ICTs to stimulate development in their countries, but they have often been hard-pressed to level the playing field so new competitors and new technologies can thrive in the market.

New technologies can help address problems not only in the developing world, but also in rural and other regions where service providers find it difficult to obtain a return on investment. In many of these regions, overly rigid regulatory structures have deprived these regions of needed help and the digital divide is worsening. Although businesses are among the first adopters of advanced technology, smaller businesses that cannot keep up the investments are left behind creating an entrepreneurial digital divide.

Carriers are finding it hard to keep up with the growing broadband traffic and seek to embed intelligence in their networks to manage their traffic better. International wholesale carriers are pushing to increase the connections between

lesser-developed regions and the rest of the world. Operators' traditional voice-centric business models are rapidly becoming recipes for disaster; operating companies are building value added services and striving to deal more efficiently with customer needs, but a viable growth model still eludes many operators.

Mobile broadband is growing rapidly; many operators expect wireless broadband revenue to exceed those for fixed broadband as early as this year. Unfortunately, without bundling additional value-added services together, mobile broadband is becoming a high capacity low-priced commodity. Nevertheless, the cell phone is the first personal mass medium and the phenomenal acceptance of the first real 'screen phone' - the iPhone - and the increased value-added broadband usage it generates as a personal mass medium device has given operators hope.

Despite the problems - the growing pains - the increased use of the Net and of fixed and mobile, wired and wireless, broadband is an immensely positive development. Services that were unimaginable a very short while ago are now becoming common and technology is rising to the challenge of providing - as it always has - more, better, bigger, faster and cheaper solutions. This issue speaks both of the problems and the solutions as seen by some of the true leaders and decision-makers in the Africa and Middle East region.

Fredric J. Morris,
Editor-in-Chief,
Connect-World



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Next step for the e-state: e-state 2.0?

by Juhan Parts, Minister of Economic Affairs, and Communications and ex-Prime Minister, Estonia

Estonia has been encouraging the use of computers and the Internet in schools since the 1990s. Students fascinated with the new tools convinced their parents to buy computers and get Internet service. This stimulated the use of e-banking, e-commerce and e-government services. The government's basic data exchange solution lets government agencies develop their own services and lets people interconnect securely to both state and private services. These are the first steps in what Estonia hopes will develop into a full-fledged e-state.



Juhan Parts is Estonia's Minister of Economic Affairs and Communications. During his political career, Mr Parts has held the following posts in Estonia's government: Deputy Secretary-General, Ministry of Justice, Auditor General, and Prime Minister (2003-2005). Mr Parts is also a Member of the 10th Riigikogu - the Parliament of Estonia - since 2003. He was Chairman of Res Publica Party.

Mr Parts graduated from the University of Tartu, where he earned a degree in law, Cum Laude.

In projecting future developments, Estonia's experience in building the e-state poses a question about the role of the state in helping today's users to contribute: how can they participate in creating new services?

How the concept of Estonia's e-state was born

In Estonia during the second half of the 1990s, the Tiger Leap project inspired citizens to buy computers on a wide scale for home use and Internet access. The project aimed to establish a solid computer base for schools and to connect educational institutions to the Internet. Schools and libraries were equipped with computers and connected with the network but there was another benefit from Tiger Leap - young people caught the

'computer germ', took it home, infected their parents with the bug and convinced them to buy a computer and connect to the Internet.

Estonians used the Internet mainly to communicate with friends, for entertainment and to search for information. The so-called entertainment phase enabled people to become acquainted with the Internet and to familiarise themselves with its opportunities. After the first users had become familiar with the Internet as an entertainment and communication medium, it became possible to offer services via the Internet. This required more participation from people than simply reading or chatting with friends. The acceptance of paid services via the Internet meant that, instead of being just a high-

technology niche product, the Internet had become a reliable service used on an everyday basis.

Creating trust through banking

In Estonia, the mass use of Internet banking stimulated the expansion of e-services. Any breakthrough in the spread of e-services must, first and foremost, take place in people's attitudes and habits. Banks are establishments with which people trust a bulk of their assets - banks symbolise trust, security, discretion, and to guarantee it, they must have maximum security. If bank clients are willing to use e-banking services, they are ready to use commercial and public sector services as well and services become a part of people's

everyday lives - as common as going to the supermarket, watching TV or reading a newspaper. Today, most of Estonia's retail trade is facilitated by the Internet.

The development of the information society and e-state has been Estonia's policy and priority for almost ten years. Estonia's e-state is developing simultaneously as both the Internet and people's habits change. As a result, many types of e-services, such as easy and secure submission of tax declarations to the Tax Board via the e-taxboard service,

are now available for use. Establishing a company via the Internet takes less than a day and the founder can accomplish the task using a digital signature certified by the state.

However, the most important thing is that citizens of Estonia can exercise their rights and obligations as citizens - including being able to vote in parliamentary elections - using the Internet. The 2007 parliamentary elections in Estonia were unique in the world - for the first time citizens could vote for legislative power via the Internet, by using their ID-card.

Decentralised service

E-services do not function by themselves; users and infrastructure to support the services are needed.

Decentralisation has been the primary principle in the development of Estonian e-services. Accordingly, those who can create superior content and services make them available via the Internet to all those who wish to use them. There is no central organisation in Estonia to develop the e-state and create services, thus every state agency is free to develop the necessary systems itself. The only criterion that has to be met in the development of decentralised systems is interoperability. Systems must 'understand' each other and be able to operate and exchange information among themselves.

This principle means that the number of centrally developed components is minimised and only those needed by the organisations creating services are developed. For example, the Tax Board develops its e-taxboard independently, the Ministry of Justice develops its company registration system itself, and so forth.

Although the centrally developed state information system is kept to the minimum, it plays an indispensable role. The most important central solution is the X-Road, the functioning of which is maintained by the state. X-Road is a data exchange layer that private companies and state agencies can connect to by user interfaces, making it possible to exchange information with each other.

Rapid development is one of the main benefits of decentralisation; since each organisation knows the needs of its users best, it is therefore the most efficient in creating those services.

The logic of decentralised state information systems is comparable with the logic of the market economy. Everybody has the freedom to do whatever they are capable of, however they consider best. Many applications are created simultaneously and their development is facilitated, rather than hindered, by numerous central criteria.

The ID-card is another essential state-centred solution. The ID-card, the size of a credit card, is a secure means of identification equipped with a chip. It can be used for identification instead of a passport, inter alia, for travelling inside the European Union and for using a





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CONFERENCE AGENDA	Tracks				
	Voice On The Net	Video On The Move	Wireless Futures	Innovators Forum	Unified Everything
Pre-Conference	Monday 2 June 2008				
9:00 - 17:00	Pre-Conference Workshop: Carrier Ethernet for Business				
9:00 - 17:00	Pre-Conference Workshop: SIP Tutorial				
9:00 - 17:00	Pre-Conference Workshop: 2 nd Annual ENUM and Peering Summit				
Day 1	Tuesday 3 June 2008				
8:00 - 9:00	Registration & Continental Breakfast				
9:00 - 9:30	Keynote Address: Mitel Networks, Terry Matthews, Chairman				
9:30 - 10:00	Keynote Address: Skype, Rodrigo Madanes, Chief Product Strategist				
VON Expo is Open	10:00 - 11:00	Visit The VON Expo™ Floor - includes product demonstrations, expo keynotes, and additional content			
	11:00 - 11:25	Industry Perspective: Pulvermedia Inc., Jeff Pulver, Founder & Chairman			
	11:25 - 11:50	Industry Perspective: Thomson, Tiann Schutte, General Manager, Software Services Platform			
	11:50 - 12:15	Industry Perspective: UPC Broadband Holding Services BV, Eric Lennon, CTO			
	12:15 - 12:40	Industry Perspective			
	13:00 - 15:00	Networking Luncheon/Visit The VON Expo™ Floor			
	15:00 - 15:30	Track Chair Introductions	Track Chair Introductions	Track Chair Introductions	Track Chair Introductions
	15:30 - 16:45	Carrier Convergence	Mobile TV: A Classical Battle is Brewing	Web 2.0 and Telco 2.0: Making Money Together?	An Alternative to Border Management
17:00 - 18:30	Welcome Reception by The VON Expo™ Floor				
Day 2	Wednesday 4 June 2008				
8:00 - 9:00	Registration & Continental Breakfast				
9:00 - 9:30	Keynote Address: Digium, Mark Spencer, Founder & CTO				
9:30 - 10:00	Keynote Address: Alcatel-Lucent, Martine Laperre, Carriers Group/Executive Management Team & VP Co.				
VON Expo is Open	10:00 - 11:00	Visit The VON Expo™ Floor - includes product demonstrations, expo keynotes, and additional content			
	11:00 - 12:15	General Session: Telecom For the New EU			
	12:15 - 14:00	Networking Luncheon/Visit The VON Expo™ Floor			
	14:00 - 15:15	Using Advertising to Supplement Service	The TV vs. The PC - The Lessons and Issues of User Interfaces		P2P For Mobile Devices/ for the Enterprise
	15:15 - 16:15	Visit The VON Expo™ Floor - includes product demonstrations, expo keynotes, and additional content			
	16:15 - 16:40	Industry Perspective			
	16:40 - 18:00		QoE Issues in Triple Play	FMC: A Significant First Step	One Virtual Network
	Day 3	Thursday 5 June 2008			
8:00 - 9:00	Registration & Continental Breakfast				
9:00 - 10:15	Service Delivery Platform	Video on Demand Architectures	IMS Standards & Interoperability Update	XML and SDP: The Meet Point	One Real-Time Experience
10:15 - 10:45	Networking Break				
10:45 - 12:00	Managing the Edge	Open Cable Application Platform [OCAP]: What's the Impact?	Mobile VoIP Mashups	Peer 2 Peer Update	Ubiquitous UC: The Web Model
12:00 - 13:30	Networking Lunch				
13:30 - 14:45	The "I" in the IP-PBX	3G & HD Video Collaboration	Femtocells: Bringing Home the 3G Network	OpenSER Updates: Time for the App Servers to Deliver	Call Centers Adopt UC

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digital signature. The ID-card is more popular than the paper passport - almost 90 per cent of Estonian citizens have one. The card enables citizens to identify themselves electronically when communicating with state agencies, but also when using the e-services of banks or other private companies. Although the functioning of the ID-card is secured by the state, NGOs may also create ID-card services. I consider that the integration of the public sector and commercial services in developing the e-state is of utmost importance.

The concept of an e-service space is quite important. E-service space is an environment where providers of services, i.e. entrepreneurs, NGOs and the public sector can freely communicate with the users of services. The service space includes the infrastructure for the provision of services, as well as the preparedness of its users. In other words, e-service space is a virtual environment where it is easy to provide and convenient to use a wide variety of services.

What will e-state 2.0 look like?

Today's information and communications technology processes are largely replacing those where paper and pencil and, not so long ago, facsimile transmission were once used. Processes are faster, more easily available and convenient on the Internet. However, information technology makes it possible to create completely new operation chains and systems of events which do not copy the existing ones. We will get the whole benefit from technology only if we are able

to generate totally new processes taking advantage of the new opportunities.

In the e-state 1.0, state/citizen communications on the Internet is of central importance. The concept of e-state 2.0 covers processes created by information and communication technology that do not copy the processes created in the paper and pencil era - would not even be possible with pencils and paper, but are completely new ICT-dependent services. Today, many such services use various word processors, browsers and other standard computer programmes, but tomorrow, we will be able to use various special interfaces or communication environments to communicate with the e-state to access more user-friendly and powerful services.

The Internet world is gradually moving towards platforms that enable the development of various services and processes. The platforms also make it easy to find the services. Moreover, the platforms specify a logically built framework for a service, so that the interface for each service will be as similar as possible to the others and thus, easier to use.

It is too early to say whether Google, Microsoft, some application of a social network, or something else, will eventually provide such a platform.

Whatever the platform is, the development of e-state 2.0 will take a similar turn. Until now, people could only use the services developed and provided by the state, but in

the future, they will be able to create services for themselves with the help of a platform. For e-state 2.0, the main concept is e-service space where the state secures infrastructure in the form of a universal data exchange layer and secure 'authentication'- authentication and identification. The state's function will be to supply service creators with data, which today are mainly kept in the state's databases.

The creation of e-state applications will gradually move out of the public sector. It will be easier to create services based upon widely accepted standards; standards-based services can be used more easily and they will be more available. Ideas will be of utmost importance. People will be able to create their own e-state view, the e-state will become more personal, and many new processes will arise that take full advantage of the technology.

Proactivity will be an important feature of e-state 2.0. This means that users will not have to provide data that already exists in the systems. The system will query all the systems connected before asking the user for data. Proactivity will require much more interoperability than we now have, but this will be remedied with time.

E-state 2.0 will provide more convenient, direct and speedy communication between the state and its citizens. The next generation e-state requires much more interoperability of systems and international cooperation. For global cooperation, though, many political agreements will be needed. ●



Growing the Internet in Bulgaria

Dr. Plamen Vatchkov, Chairman of State Agency for Information Technologies and Communications, Bulgaria

The United Nation's Global Digital Solidarity Fund (DSF) is an effort to reduce the digital divide by providing developing countries with access to information and communications. The Internet has brought new opportunities to the world's developing economies. It made outsourcing possible, for example, which brought new jobs and know-how; as a result developing regions became major exporters of business services to the rest of the world - something unthinkable only ten years ago. Traditionally, decades of development and intensive government spending were required for significant change. Today, a modern and well-supported information and communication technology (ICT) infrastructure, qualified staff and good governance drive rapid change. The DSF is financed by a one per cent 'digital solidarity contribution' levied voluntarily upon purchases of ICT-related equipment. The DSF is giving priority to its 1000 telemedicine units for Africa programme, and its educational programme which distributes interactive whiteboards for classrooms.



Dr Vatchkov is the Chairman of Bulgaria's State Agency for Information Technology and Communications. He chairs the National Radio Frequency Council and the Interdepartmental Commission for Space Research and is an Associate Professor in Technical Sciences at the Higher Commission for Attestation. In his long career, Dr Vatchkov has served in a wide variety of executive and academic posts including: Deputy Director Operations of Cabletel; Director of Information Technology, Overgas Holding; Managing Director of Bulvar Electronics, Ltd; Deputy Director of the Institute for Technical Cybernetics and Robotics of the Bulgarian Academy of Sciences; General Director of Micro Processing Systems; and as an Assistant Professor at the Technical University in Moscow. Dr Vatchkov began his career as an engineer at the Central Computing Institute in Sofia.

He is currently a member of the Academic Council of the International University and a member of the Balkan Academy of Sciences and a member of the Federation of the Scientific and Technical Unions in Bulgaria and the Union of Scientists in Bulgaria. Dr Vatchkov is a former member of the Scientific Council of the Institute for Technical Cybernetics and Robotics. He was awarded the 2007 prize of the Bulgarian Association of Information Technologies for overall personal contribution to the development of the information technologies in Bulgaria.

Dr Vatchkov obtained a MSc in Industrial Electronics and PhD in Technical Sciences at the Moscow Power Engineering Institute. Dr Vatchkov has specialisations in Microprocessor Devices, Management and Quality Management.

The Internet via broadband and the digital technologies have, during the last decade, dramatically changed the way people around the world live and work. Outsourcing brings new jobs and know-how to the developing regions of the world; as a result these regions have become major exporters of business

“Today, important hardware suppliers have significant manufacturing operations in Singapore and China, and major companies develop their software in India and the tax returns of American citizens are increasingly prepared by Israeli, Indian or Bulgarian accounting firms.”

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“The global economy is not the same as that of a highly internationalized nation. The global economy is based on the ability of the core activities - meaning money, capital markets, production systems, management systems, information - to work as a unit in real time on a planetary scale. Meaning that, at this point, we can process, and we do, billions and billions of dollars in seconds.”

services to the rest of the world. Outsourcing provides these regions with opportunities that would have been unthinkable only ten years ago. Today, important hardware suppliers have significant manufacturing operations in Singapore and China, and major companies develop their software in India and the tax returns of American citizens are increasingly prepared by Israeli, Indian or Bulgarian accounting firms.

We are rapidly entering upon a new era of ubiquitous computing and communications. Over a decade ago, the late Mark Weiser developed a seminal vision of future technological ubiquity - one in which the increasing availability of processing power would be accompanied by its decreasing visibility. As he observed, “the most profound technologies are those that disappear, they weave themselves into the fabric of everyday life until they are indistinguishable from it”. Early forms of ubiquitous information and communication networks are evident in the widespread use of mobile phones, smart phones and Radio Frequency Identification (RFID). The world is becoming ‘flat’; innovation and technology are driving a new vision of development based upon a networked society, which is rapidly changing cultural, economic and political factors and traditions around the globe.

“The information technology paradigm is based on flexibility - the processes are reversible and organizations and institutions can be modified, even fundamentally altered, by rearranging their components.”

In his book, *The Rise of the Network Society*, the Spanish sociologist Manuel Castells, states that networks constitute the new social morphology of our societies: “Our world, and our lives, are being shaped by the conflicting trends of globalization and identity. The information technology revolution, and the

restructuring of capitalism, have induced a new form of society, the network society. It is characterized by the globalization of strategically decisive economic activities: by the networking form of organisation; by the flexibility and instability of work, and the individualization of labour; by a culture of real virtuality constructed by a pervasive, interconnected, and diversified media system; and by the transformation of material foundations of life, space and time, through the constitution of a space of flows and of timeless time, as expressions of dominant activities and controlling elites.

In the information age, information - however construed - becomes the most important input and output of the economy. Since ‘information’ is both transformative and opportunistic, it colonizes all areas of experience. Hence, the ‘information age’ is also social and cultural in addition to material.

These changes - economic policy, economic autonomy of governments, and, ultimately, the relationship between the governments and the economy - are only possible because of deregulation and liberalization that took place in the 1980s in most countries, and because of the existence of an infrastructure of telecommunications, information systems, and fast transportation systems that provide the technological capacity for the system to work as a unit on a global scale.”

The global economy is not the same as that of a highly internationalized nation. The global economy is based on the ability of the core activities - meaning money, capital markets, production systems, management systems, information - to work as a unit in real time on a planetary scale. Meaning that, at this point, we can process, and we do, billions and billions of dollars in seconds. And that can change from values to values, from markets to markets, from currencies to currencies, which increases the complexity, the size, and, ultimately, the volatility of global financial markets around the world. Which, in fact, makes impossible any kind of autonomy of financial markets in one country or one place vis-à-vis what’s happening in the global system; which, therefore, makes extremely

difficult any kind of monetary and budget policy which does not take into consideration the global financial market.

The accumulation of a critical mass of inventions, technologies and infrastructure first made it possible to feel the effects of this new situation at the end of the twentieth and in the beginning of the twenty-first century. One of the most important consequences of the intellectualization of the economy is the changing technological paradigm. The notion of *technical paradigm* elaborated by Carola Perez, Christofer Freeman and Giovanni Dosi, is an adaptation of the classical analysis of scientific revolutions by Thomas Khun. Manuel Castells defines the milestones of the new technological paradigm as follows:

1. Information is a raw material - technologies now have an impact upon information, in past technological revolutions information had an impact upon the technologies;
2. Pervasiveness of the new technologies provides a new level of quality - information is an integral part of all human activity, all processes of our individual and collective existence are directly shaped by the new technological medium;
3. Any system or set of relationships using the new information technologies need a networking logic, otherwise the system remains marginal and cannot become part of the technological paradigm;
4. The information technology paradigm is based on flexibility - the processes are reversible and organisations and institutions can be modified, even fundamentally altered, by rearranging their components;
5. The growing convergence of specific technologies into a highly integrated system - in the network economy, the innovative breakouts in one area quickly and easily lead to inventions in other areas and the synergies increase their effectiveness. The examples are all around us: The impact of microelectronics and software innovations, for example, upon telecommunications has stimulated the growth of networking and increased productivity.

“Today’s digital ecosystems are built upon networked architectures and collaborative environments that bypass the weaknesses of current client-server, peer-to-peer, grid, and web services.”

Many developments in biology, chemistry and physics during the last twenty years are due to powerful new information technologies; nanotechnologies are growing based upon microelectronic manufacturing technologies; and

6. The information technology (IT) paradigm, today, is that of a network - it is as accessible, adaptive and open as FOSS (free and open software) and, since everybody can add information and knowledge, IT is increasingly stable, trusted and secure.

The EU is an integral part of the global network, and effective participation in this global network is crucially important to accelerate Bulgaria’s social and economic development. Traditionally, decades of gradual development and intensive government spending would be required for significant change. The rapid changes we are speaking about require a modern and well supported information and communication technology (ICT) infrastructure, qualified staff and good governance.

The ubiquitous network society, the new technological paradigm, will be based to a great extent upon the development of the ‘Internet of Things’ and a robust digital ecosystem.

At the dawn of the Internet revolution, users were amazed at the ability to access people and information across oceans and time zones, with only a few clicks of their mouse. To do so, however, they needed a computer (PC) to connect to the Internet. Today, one can also use mobile phones and WiFi connected laptops. Today via the Internet, we can connect to people anytime, anywhere; the next logical step in this technological revolution is to connect inanimate objects via the same network. This is the vision underlying the Internet of Things. The use of electronic RFID (radio frequency

“At the dawn of the Internet revolution, users were amazed at the ability to access people and information across oceans and time zones, with only a few clicks of their mouse.”

identification) as tags and sensors in everyday items such as razors, shoes and packaging, will extend communication and monitoring potential to a vast series of new applications and services via the Internet. Advances in nanotechnology (i.e. manipulation of matter at the molecular level) will further accelerate these developments.

We are on the brink of a new computing and communication era, one that will radically transform our enterprise, community, and personal spheres. With continuing developments in miniaturization and declining costs, it is becoming not only technologically possible but also economically feasible to make everyday objects smarter, and to connect the world of people with the world of things. Building this new environment however, will pose a number of challenges. Technological standardization in most areas is still in its infancy, or remains fragmented. Not surprisingly, managing and fostering rapid technological innovation will be a challenge for governments and industry alike.

One of the most important challenges will be convincing users to adopt emerging technologies like RFID. Concerns over privacy and data protection are widespread, particularly as sensors and smart tags can track a user’s movements, habits and preferences on a perpetual basis. Fears related to nanotechnology range from bio-medical hazards to robotic control. Despite the concern, scientific and technological advances in these fields continue to move ahead at breakneck speed. It is through awareness of such advances, and the challenges they present, that we can prepare ourselves to reap the benefits of a fair, user-centric and global Internet of Things.

Digital ecosystems are moving away from the traditional, rigidly defined, collaborative environments into an open, flexible, domain cluster, demand-driven, interactive environment. Today’s digital ecosystems are built upon networked architectures and collaborative environments that bypass the weaknesses of current client-server, peer-to-peer, grid, and web services.

The global use of the Internet is rapidly rising. It is helping to close the digital divide between nations and to make life the world over easier and more cheerful. ●

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The challenge of NGNs

by Mathias Kurth, President of Germany's Federal Network Agency, for Electricity, Gas, Telecommunications, Post and Railway

The move from traditional POTS (plain old telephony systems) to next generation networks - NGNs - networks involves a series of technological, economic and regulatory challenges. NGNs are more efficient, and offer both operators and subscribers a much greater variety of options and lower costs than traditional networks. The facilities, structure and cost of the new networks challenge the ingenuity of the regulators that must reconcile existing legal requirements based upon the older technologies with the realities of the new technologies and markets.



Mathias Kurth is the President of Germany's Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway, having previously been its Vice President. During his career, Mr Kurth has been Director of Business Development, Law and Regulation for COLT Telekom GmbH, Chairman of the Conference of Heads of administration of the Ministers of Economics, at federal and state level, and a Member of the Supervisory Board of the Deutsche Ausgleichsbank. Mr Kurth has also been Representative of the State of Hesse in the Committee of the Regions of the European Union, Representative of the State of Hesse, in the Regulatory Council for Posts and Telecommunications, State Secretary in the Hesse Ministry of Economics, Transport and Urban and Regional Development, Head of Administration and Permanent Deputy of the Minister, Parliamentary Secretary and Deputy Chairman of the SPD Group in the Land Parliament, and a Member of the Presidium of the Hesse Land Parliament and judge at the Darmstadt Regional Court.

Mathias Kurth studied Law and Economics at Frankfurt am Main University, and was a postgraduate legal trainee in the Administration of Justice of the State of Hesse.

We have come a long way from the aptly named 'plain old telephony system' (POTS) in the last few years. The Internet has proven to be more than hype on the transmission side. Packet-based connections are the future of telecommunications - and this future has just begun.

Public switched networks are migrating to so called next generation networks in Germany (and the rest of Europe) right now. In Germany, especially, there are different paths for this migration. The incumbent, Deutsche Telekom AG, has chosen a fibre to the cabinet (FTTCab) approach with its VDSL (Very High Speed Digital Subscriber Line) rollout. Competitive operators have chosen a different route, and are deploying fibre to the home (FTTH) networks in some areas.

The migration from public switched networks to IP-based networks is a big change, and that does not apply solely to the technical side. Access regulation has been moulded on the old technology because there was nothing else, when the European telecom markets were opened for competition. Now the regulators have to adapt their methods to encompass the new ways things are done.

In Germany, the national regulatory authority called Bundesnetzagentur, early on, started a discussion process with the market players. A national project group was established to study the 'framework for the interconnection of IP-based networks'. On a European scale, that discussion is also in progress. The Independent Regulators Group (IRG), the European Regulators Group (ERG) have

made great progress in tackling the task and have published a report on Interconnection and an ERG Opinion on Regulatory Principles of NGA.

From the change in network infrastructure follows the need to adapt the existing wholesale products. There is also a need to evaluate if, and in what way, NGNs impact on the market definitions and findings on significant market power that are part of the regulatory framework of the European Union, and rates approval procedures. For multi-service networks, it is even more difficult than for a PSTN to allocate the infrastructure costs to specific services and wholesale products. With the switch toward NGN, there can be changes in regard to the size and reach advantages and the need for interconnection.

“As the worlds of traditional telephony networks and Internet collide with migration to NGN, two incompatible billing philosophies will also collide; PSTN networks work with termination fees, but the Internet is governed by ‘bill and keep’.”

As the last mile will still be the NGN access bottleneck, access to these infrastructures will continue to play a central role.

In its findings on a future NGN regime, the Bundesnetzagentur identified several points that are vital for the success of NGN.

The first point is that the transport and service layers should be differentiated. Technically, there is no longer any need to bind certain services to certain technical preconditions, which is what network voice service providers plan. Such an artificial link between transport and service in an NGN, whose definition assumes the lack of such links, might well hinder the realisation of the NGN concept as a whole - or at least make it harder to take advantage of the potential of NGN to spread innovative services. Thus, the Bundesnetzagentur can only accept such behaviour as a temporary measure in the early stages of the switch over to NGN.

After the switch to NGN, one thing will not change - the incumbent will still own most of the last mile. A direct consequence of this fact is the need for ongoing regulation of interconnection pricing. The long-run incremental costs of efficient service provision (LRIC) serves as the basis for tariff regulation in Germany. One of the main reasons for migration to NGNs is that they cost less to maintain than PSTN networks. If NGNs cost less than PSTNs, it is obvious that NGN should be the benchmark for the cost of providing efficient service. Using a different cost basis for each technology used is not permitted under the current German telecommunications act (TKG). Nevertheless, an abrupt change in the basis of cost accounting would tend to disrupt the market.

It is impossible for any network provider with a telecommunications network that is more than a few years old to make the migration from PSTN to NGN in a single day. It is not the Bundesnetzagentur's intent to make operators suffer for not being able to do the impossible. Instead, it appears reasonable to implement a glide path - a cost index based partly upon the costs for PSTN networks and partly upon those for NGN. While, in the beginning, the weight of PSTN costs in that equation would be higher, it would fall as the NGN rollout progresses. With this solution,

though, interconnection costs would be higher for some time than the costs of efficient NGN service provision - a situation that is difficult to reconcile with the TKG regulatory regime. Another foundation of the current interconnection regime is the structuring of interconnection services into local, single transit and double transit categories. With NGNs, the number of interconnection points will fall, making the old categories redundant. There is no definite answer yet to the question - “How many interconnection points will still be needed?” - the estimates range from 1 to 100. Accordingly, many interconnection points will disappear, which means stranded investments especially for those network operators connected to many points. In order to compensate for that unfortunate effect, a glide path should be implemented - that is a phased reduction in the number of interconnection points needed.

As the worlds of traditional telephony networks and Internet collide with migration to NGN, two incompatible billing philosophies will also collide; PSTN networks work with termination fees, but the Internet is governed by ‘bill and keep’. Bill and keep is a pricing method for network interconnection whereby there is no termination charge for calls; each network terminates calls from the other at no charge - they keep whatever they charge their own customers. When the old telephony networks become packet switched networks - NGNs - it will be feasible to charge for them on a bill and keep basis. Bill and keep goes hand in hand with the increasingly popular flat rates, not only for Internet access, but also for voice services. Switching over to a bill and keep would simply implement a billing system that end-users prefer.

NGNs are already becoming reality. The technical and economical questions involved in the migration are largely understood and operators are making large investments in the switch to NGNs. What we do not know is when and where the deployment will take place. That can cause unnecessary friction in the deployment of the new technology. When the incumbent's rollout plans are unknown it is difficult for other carriers, who need to interconnect with the incumbent, to plan their network with any degree of long-term efficiency, raising the probability of lost investments.

Although the secrecy of rollout plans may be understandable from a business point of view, it is a problem for the market as a whole. NGN migration should not be seen as a way to hurt competitors, but as a road to more efficient networks. Accordingly, the Bundesnetzagentur encourages open and constructive dialogue between market players. The path and milestones for network migrations should be freely modelled and set through dialogues between the market's players. ●



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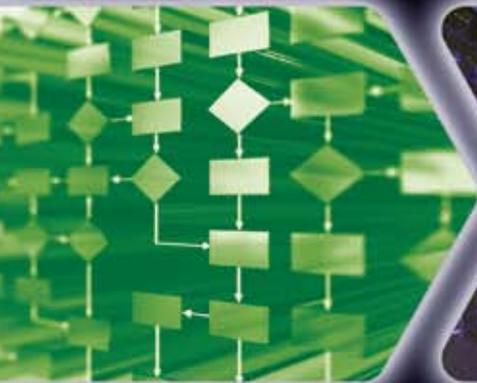
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Business innovation and ICT in the Baltic region

Prof. Edvins Karnitis, Expert Forum for the National Development Plan, and Commissioner of the Public Utilities Commission, Latvia

The Baltic States and their economies and businesses are mostly small, so they count upon ICTs to help drive their development. ICT expenditures in the Baltic region are high. Latvia spends 9.9 per cent of its GDP compared to 5.7 per cent for the EU 27, and Estonia's broadband penetration is higher than the EU's average. Large enterprises use ICTs heavily, but the smaller companies lag far behind, which often keeps them from doing business with large and transnational companies.



Prof. Edvins Karnitis is a Commissioner of Latvia's Public Utilities Commission and a Member of its Expert Forum for the National Development Plan. Prof., Dr. Sc. Eng. Edvins Karnitis is a Leading Researcher of the University of Latvia, a Member of the Advisory Board of Riga Technical University, an Analyst of the National Commission of Strategic Analysis, and Chairman of the Expert Team on Monitoring the Implementation of the National Development Plan. He has worked as Adviser to the Prime Minister and Minister of Economy of Latvia, and has participated in the elaboration of national strategic programmes for knowledge-based development and knowledge economy in Latvia. Dr Karnitis is the author of more than 170 scientific and technical publications.

Knowledge-based development scenarios are becoming more and more popular worldwide. The decision adopted at the Lisbon Summit Meeting in 2000 determines precisely this strategy for the development of the EU. The Baltic States also - Estonia, Latvia and Lithuania - have always respected knowledge. We have defined the basic resource for our growth as the knowledge and wisdom of our inhabitants, and the ability of each individual to make use of them.¹ Development of an innovative economy is a principal component of our growth model.

As the importance of knowledge and innovation in business increases, cooperation between partners and the transfer of knowledge become more intensive; this means a radical increase in the processing, collection and sharing of information. To a great extent, these activities are supported by the use of advanced information and communications technologies (ICT) in business. In fact, it is thanks to ICT that knowledge-based developmental processes have become possible.

A turnabout is going on: Latvia and Lithuania are ranked as efficiency driven economies and Estonia - is already transforming itself into an innovation driven economy. The factor driven model, which is based on low added value products and processes, is currently not very significant in the Baltic.² There are, though, a number of factors that help drive innovation in the Baltic States:

- the limited human resources and small economies: all of the states together comprise only 0.1 per cent of humanity, our GDP is

about 0.2 per cent of the world's GDP; for this reason participation in international partnership networks is a principal necessity for Baltic companies;

- a high proportion of micro, small and medium-sized enterprises (Latvia - LV - more than 99.9 per cent) and lack of large enterprises, especially with 1000+ employees; naturally, only a few have their own R&D departments, although this is increasing (LV -18 per cent of enterprises in 2003, 24 per cent in 2007);

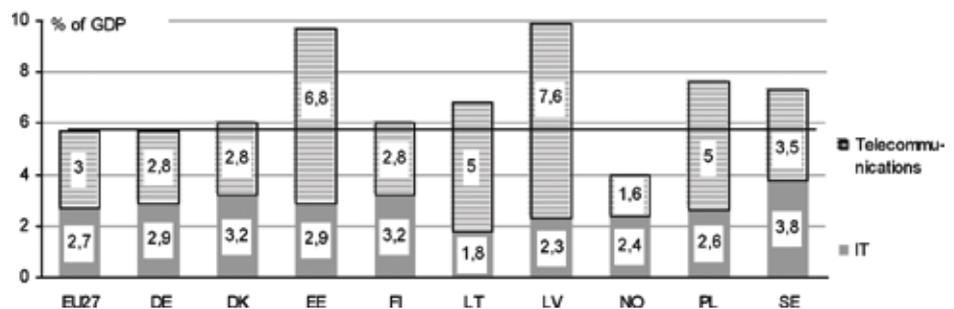


Fig. 1. Investments in ICT infrastructure and services (2006)

¹ E.g., *Latvian National Development Plan 2007–2013*. -<http://www.nap.lv/en/>.

² *Global Competitiveness Index 2007–2008*. -<http://www.weforum.org/en/index.htm>.

³ *Statistical data from Eurostat and National Statistical Offices are used here and further.*

- a high and increasing share of service sectors in each of these economies - 75 per cent of total value added in LV (2005) in comparison with 50 per cent in EU25; service innovation requires highly regular, persistent, real-time contact with partners compared to the contact needed for manufacturing innovation;³
- the concentration of R&D personnel in the academic sector; business sector's R&D personnel account for only 0.27 per cent of the total labour force in EE (Estonia), 0.18 per cent in LV and 0.1 per cent in LT (Lithuania) in 2005, in comparison with the EU25 - 0.6 per cent, FI (Finland) - 1.6 per cent; this increases the need to actively outsource R&D and the transfer of knowledge and technology: 43 per cent of innovative enterprises (LT) had some kind of cooperative arrangements in 2004-2006, 27 per cent used extramural R&D, 31 per cent acquired external knowledge;
- the high capacity of the R&D sector is corroborated by its intensive financing abroad: LV - 18.5 per cent of gross expenditure on R&D in 2005, EE - 17 per cent (EU27 - 8.5 per cent, FI - 3.2 per cent); and
- mentality and traditions - stability at work; job-to-job mobility of highly qualified people is comparatively low: EE - 5.2 per cent in 2005, LV - 5.7 per cent, LT - 5.95 per cent, EU27 - 6.1 per cent, FI - 8.7 per cent.

These characteristics make close cooperation necessary for effective and reliable knowledge exchange and to integrate the activities of internal and external partners. There were high growth rates for innovative activities in the Baltic States from 2003 to 2007.⁴ Because of the above mentioned characteristics, the intelligent use of ICTs serve Baltic enterprises - perhaps more than many other countries - as a powerful catalyst for innovation.

ICT investments and the penetration

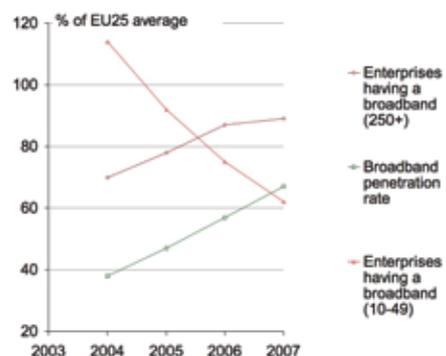


Fig. 2. Broadband connections: Lithuanian indicators compared to EU25 average

of broadband Internet connections are important factors in characterising the level of innovation in any country. There is a clearly positive reciprocal link between the use of ICT to facilitate business processes and drive greater productivity, and higher income. These, in turn, can stimulate greater investments in technologies and services and create new opportunities for growth. The level of ICT expenditure in the Baltic has been consistently high; LV is the EU leader (9.9 per cent of GDP in 2006), EE is the next (9.7 per cent) compared to 5.7 per cent for EU27 (Figure.1). Our weakness is the small percentage of total investments dedicated to IT tools and services.

Without a broadband Internet connection, no enterprise today can ensure effective cooperation with scientific institutions and cluster partners. The total broadband penetration rate in Estonia (20.0 in 2007) is higher than the EU average (18.2); and Latvia and Lithuania are quickly catching up too. The number of connections in households, libraries, educational and public institutions is also rapidly increasing. There are problems with the development of business broadband connections in comparison with EU growth rates (Figure. 2). Indicators at large enterprises are not bad, but let us remember that use of ICT by such enterprises is close to the saturation point. Still, small and medium enterprises lag far behind the EU average growth rate; and they are falling further behind, although at one time they were quite good.

Introduction of ICT is not an end in itself; the goal and effectiveness of their use is of key importance. In addition to obtaining and exchanging information, it is clear that migrating to a network environment, including 'intranets' and 'extranets', and transferring business activities to that environment creates extensive opportunities to improve and integrate the process of innovation for product design, development and manufacturing within the enterprise and in cooperation with partners.

There is visible correlation of the innovation efficiency (i.e., transformation of innovation inputs into outputs) with the level of internal and external integration of business processes (Figure. 3).⁵ For example, the enterprises of Sweden and UK are poorly integrated and in spite of very strong inputs to the process of innovation they are comparatively inefficient.

The use of ICT by Baltic enterprises - levels of both internal and external integration are substantially below EU average figures - is still insufficient and relatively inefficient.

Large enterprises are the most active users of ICT in the Baltic region as everywhere, while small enterprises are at a lower level of development in all aspects. The usage of ICT by micro enterprises is in its infancy by any measure; even the spread of fundamental technologies has not risen above the average level of the active development stage, to say nothing of process integration.

This has resulted in the low efficiency of innovation in the Baltic States and weak exploitation of existing innovation. Clearly, the failure of enterprises to appreciate the importance of ICT does nothing to facilitate the emergence of innovative economies in the Baltic States. The motivations for enterprises to more aggressively adopt and use ICT remain insufficient, so business people choose short-term solutions as opposed to investment in technology. This shows, in turn, that the governmental business support programmes have not been as well targeted and effective as could be hoped.

This situation is very risky for Baltic enterprises. Micro and small enterprises may find themselves entirely excluded from the networks of partners and suppliers of large and transnational companies. This is why micro and small enterprises require specific support, including EU funds, to help them use ICT in business processes. They need help in other ways as well - enhancing the strategic perception of employee management and IT skills, supporting the development and introduction of specific e-solutions for small/micro enterprises, organising small partners into clusters, providing competence centres, and building business networks to facilitate partnership with large enterprises and the like.

The potential benefits for enterprises in Estonia, Latvia and Lithuania can be seen clearly if we look at the achievements of those countries in the EU that have done best in this regard. ●

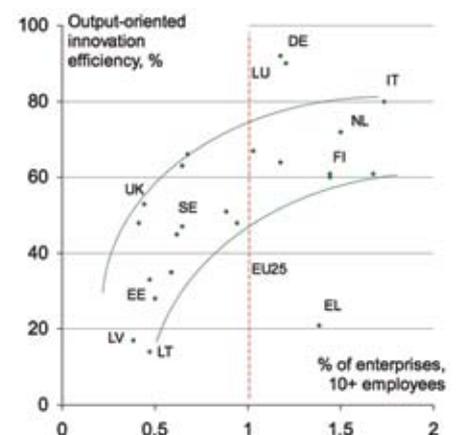


Fig. 3. Correlation between the percentage of enterprises with internal/external integration of business processes (related to EU25 average) and the efficiency of innovation

⁴ European Innovation Scoreboard 2007. -<http://www.proinno-europe.eu>.

⁵ Measuring Innovation efficiency; INNO-Metrics Thematic Paper. -<http://www.proinno-europe.eu/>.

Building ICT usage in South Eastern Europe

by Moniu Monev, CEO of Nexcom Bulgaria

Bulgaria started liberalising and modernising its telecommunications sector rather late, as a result, its Internet penetration rate is only 30 per cent. Nevertheless, in the last two years, with Bulgaria's accession to the EU and its adoption of new regulations harmonised with the EU, foreign investment has grown and local broadband access was unbundled by the incumbent. This has introduced needed competition - especially through the introduction of WiMAX, forced rate cuts and stimulated the overall growth of the sector.



Moniu Monev is a co-founder and the CEO of Nexcom Bulgaria, the first operator in the country to commercially offer WiMAX services, including wireless Internet, telephone, leased lines, VPN and MAN.

Previously, Mr Monev was the Vice President of Marketing, Balkan Area at Nexcom Telecom, USA. He also established telecom companies in Macedonia, Albania, and Romania, a JV in Serbia and started network operations in Romania and Macedonia.

Moniu Monev graduated from the National Film and Theatre Academy in Sofia, Bulgaria with a Master of Arts degree.

When Prof. Kleinrock, in whose laboratory ARPANET the world's first packet switched computer network was developed, made his important contributions to the field of computer networking, he spoke of a vision of an 'Intergalactic Network', 'where everyone on the globe is interconnected and can access programmes and data at any site from anywhere'.

Even so, he probably he did not realize the full extent to which his work and that of the scientists who followed would influence the everyday lives of people around the world within the following decades.

The Internet is at the core of the current process of economic globalization. The world economy is now characterized by the almost instantaneous flow of information, capital, and cultural communication. New areas of the world and new regions within countries are experiencing growth by becoming part of the information society as providers and users of

information and communication technologies (ICTs). The networks themselves both reflect and create distinctive cultures within the global information society.

However, despite the virtual fall of boundaries, the pace of becoming part of this society and accepting this culture varies depending on the initial set of local conditions. The specific socio-economic context defines, from the outset, the extent and the speed of introduction of new technologies as means of participation in the new economy. The country-specific social and economic environment however, leads

not only to different timetables for inclusion in the race, but also influences the speed at which regions gain momentum in their ICT development.

The digital divide still has not been bridged despite the measures taken by policymakers, service providers and other non-government organizations who seek ways to achieve widespread use of the Internet. There is still a significant gap between those who benefit from digital technologies and those who cannot. Even today, only 20 per cent of the world's 6.6 billion people have access to the Internet, and there are underdeveloped

“The world economy is now characterized by the almost instantaneous flow of information, capital, and cultural communication. New areas of the world and new regions within countries are experiencing growth by becoming part of the information society as providers and users of information and communication technologies (ICTs).”

“The Internet and the other digital technologies provide us with powerful new tools that can greatly enhance communication and commerce. New technologies lead to radical changes in communication, information processes, business management, regulations, consumer habits and requirements.”

countries that have an Internet penetration rate of less than one per cent. We are going to see many changes and new starters, but there are concerns that the digital divide will be growing, that people will continue to be excluded, as the growth of the Internet and the Information society accelerates.

Let us, for example, consider the emerging economies in Eastern Europe; although the Internet is available and growing in all countries of the region, it is not yet as widespread as in the more developed West European countries.

ICT vendors in the developed countries now compete in a marathon race to meet rising demand and consumer requirements. Emerging markets such as Bulgaria, Romania, Ukraine or Serbia to name a few are, however, trying to meet similar expectations while trying to avoid numerous existing issues and barriers. For the emerging countries in Eastern Europe, this competition is not a free run. It is a hurdle race rather than a marathon. Among the barriers telcos in the SEE region (South Eastern Europe: Albania, Bosnia and Herzegovina, Bulgaria, Greece, Macedonia, Moldova, Montenegro, Romania, Serbia, Slovenia, Turkey) have to contend with include the often inadequate or even totally lacking telecommunications infrastructure, dependence on the incumbent, slow liberalization and weak competition, delay in reforms and inadequate regulatory policies.

According to the Internet World Stats website, the Internet penetration rate is highest in Norway (88 per cent), Netherlands (87.8 per cent), Iceland (85.4 per cent), New Zealand (77.7 per cent) and Sweden (77.3 per cent). In Bulgaria, for instance the figure stands at merely 30 per cent. The fixed telco market in the country is still dominated by the incumbent. For a very long time no

real alternatives were available for either providers or end-users. The access by new operators to the ADSL infrastructure of the incumbent was postponed for several years, so these operators did not have the opportunity to provide broadband access to its end-users. As a result, most of the alternative operators had to find more capital to invest in their own infrastructure, search for alternative technologies and somehow avoid depending on the incumbent's infrastructure or wait for the bitstream agreements that give competitors access to the incumbent's access network to serve their own customers to become a reality. Other hurdles that local telcos had to deal with included, among others, an inadequate regulatory regime, the general lack of ICT education and PC literacy, the brain-drain of IT specialists followed by steadily rising labour costs, the low average personal income of population and the insufficient physical infrastructure.

The Internet and the other digital technologies provide us with powerful new tools that can greatly enhance communication and commerce. New technologies lead to radical changes in communication, information processes, business management, regulations, consumer habits and requirements. ICTs serve as a growth catalyst for economies, fostering market growth and the competitiveness in each country. There is no wonder that they have a substantial influence on the way people live, think, work, communicate, use information, entertain and educate. Since Bulgaria had delayed implementing innovative technology and restructuring its telecommunications sector accordingly, it was for a short while among the countries that risked deepening the digital divide.

To catch up with the leaders, Bulgaria had to implement all the necessary changes rapidly and effectively to cope with the hurdles. The alternative telecom operators had to be very flexible, innovative and adaptive; they needed to implement sophisticated management strategies and new product development techniques.

Some of the players merged to build a more powerful market presence, others invested in their own infrastructure, the development of new bundled solutions and the launching of new generation services. Others managed the situation by adopting the new WiMAX technology after the 3.5 GHz point-to-multipoint tender in 2005. The licence allowed their holders to develop a nation-wide WiMAX network, which they used to deliver high-speed, last-mile voice and Internet services to homes and businesses in a cost

effective way. WiMAX is an alternative to wired broadband like cable and DSL as a way to provide last-mile access to the consumers. Some operators in Bulgaria bet on WiMAX because it allowed them to quickly rollout high-speed broadband access. WiMAX easily covers large urban and suburban areas, including those areas where, under normal circumstances, distance and terrain might otherwise pose a problem. WiMAX was also a preferred solution because it required less investment for capacity building and can be used for a whole range of voice, data and multimedia services. WiMAX is a 100 per cent alternative to the incumbent and enables service providers to offer a wide range of new generation services like mobile broadband, IPTV, video on demand, telemetry, video surveillance, etc. Experts quickly pointed to the potential of the technology to win a large market share from traditional telecom operators and break the monopoly of the incumbent.

Despite the developmental hurdles facing Bulgaria, it succeeded in overcoming the difficulties and in the last one or two years the local ICT market celebrated positive changes, reforms, many new entrants, investors and strategic players.

Just to mention several of the key events: the EU accession and the acceptance of new Electronic Communications Act harmonizing the Bulgarian legislation with the 2002 Legal framework of the European Community. In addition, lower roaming rates were introduced for calls to mobile operators, the sector consolidation advanced, the growth of foreign investments was astonishing, and mobile operators were obliged to decrease their termination fees for calls from fixed to mobile networks etc. Another success, despite a four year delay, was the bitstream agreement reached between the incumbent and the Electronic Communications Association enabling other providers to access the ADSL network of the dominant operator.

The demand for broadband and penetration rates now grows rapidly. The ICT market grew 23.4 per cent in 2007 and we are optimistic about its future development. The potential of the market is enormous and even faster growth is still to come. The first positive signs for these expectations were the great increase in foreign investments Bulgaria attracted and the increased financial support by the EU aimed at significantly raising the level of innovations and funding of ICT projects. These investments in ICT implementation and development are already fostering economic growth in Bulgaria. ●

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Broadband - the worsening digital divide

by James Blessing, Chief Operations Officer, Entanet International Ltd

The digital divide is not just a problem in emerging economies. In rural regions throughout the developing world, indeed wherever service providers are not convinced they will get a reasonable return on their investment, they do not build the broadband Internet networks needed for full participation in the Information Society. The EU established universal service obligations (USOs), but they only call for telephone service and they discourage the development by local governments and private partners of viable USO alternatives.



James Blessing is the Chief Operations Officer for Entanet International, part of the Entagroup IT distribution and communications services group. Prior to joining Entanet, Mr Blessing commanded the roles of Technical Support Manager and Technical Development Manager at Zen Internet and held senior project management and technical directorship roles in the design and build of consumer facing websites for high street brands and outsourced IT support to media companies. This followed an early career in radio in which he was involved in outside broadcasting, technical operation and programme production. Mr Blessing takes an active role in the Internet industry. He is a council member of the Internet Service Providers' Association (ISPA) and is Chair of the ISPA broadband sub-group.

Mr Blessing holds a BSc in Physics with Astrophysics from the University of Kent.

For some time now, many scribes in the business and technology press have been turned on by the concept of the digital divide. The term 'digital divide' is the assertion that, while those with higher incomes in urban areas benefit from the latest digital technologies and have full access to the worldwide web, those on lower incomes and in sparsely populated or remote regions are left behind. The reason for being left behind is that they cannot afford computers, high-speed Internet access and the latest and greatest in hi-tech entertainment equipment - or because it simply is not available to them.

As technology advances at an ever-growing rate, Internet access speeds are rising and the breadth and depth of services that can be delivered to end-users is also increasing significantly. So far the growth of broadband in Europe has been a phenomenal success - in

the UK alone, broadband now accounts for 83 per cent of Internet connections.

“As technology advances at an ever-growing rate, Internet access speeds are rising and the breadth and depth of services that can be delivered to end-users is also increasing significantly.”

However, there are some problems; new services and the latest advanced technologies are typically made available only in those parts of the service providers' network where subscriber density is high. That means mostly in urban areas or areas where there is strong

competition for business - and once again this means the same towns and cities that already benefit from higher speeds and levels of service. It is only in these more densely populated regions that the service providers are willing to risk the investment required to deliver the new technologies. They are generally averse to investing in areas where they cannot be sure of generating a solid return.

As each wave of technological change - ADSL2+, Fibre to the Kerb, Fibre to the Premises - sweeps across service providers' networks, those areas that have been previously overlooked as being low priority get overlooked again. This creates a multi-tiered level of service based on location. Those areas that are classed as unattractive today will continue to be classed as unattractive in the future unless someone

intervenes (which, thanks to European Government intervention, ordinarily will not be the local government).

As long as this situation continues, the dominant incumbent service provider in any given country will be able to get away with providing the absolute minimum service at the highest possible price, at the expense of the subscribers who are at their mercy.

When the term 'digital divide' was first uttered in 1993, it was used by citizen pressure groups in the United States who wanted to force the new Internet companies to pay the additional costs of extending their products and services to lower income households. The framers of the 1996 US Telecommunications Act, after noting the existence of the digital divide, disappointed social activists by insisting it wasn't the Government's role to redress it. The various federal government programmes that had been set up to close the gap between the technology-rich and technology-poor groups during the Clinton era were discontinued under President Bush. After 2000, governments in more advanced countries no longer pressured high-tech companies to address the issue.

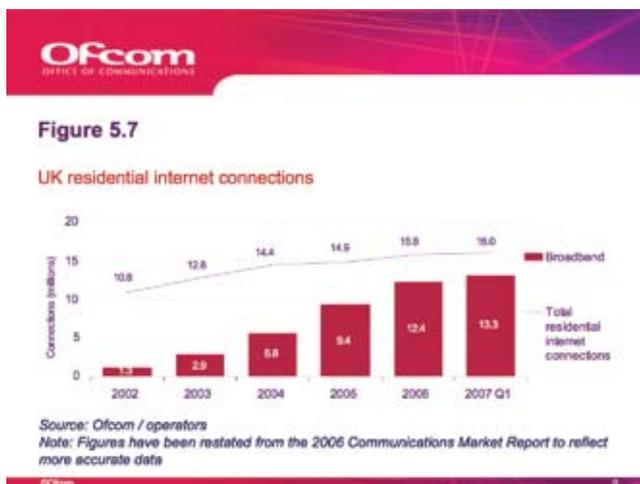
As concern over the digital divide declined in the US, it surged in emerging markets. Many developing countries searched for a formula to close the gap, which would free them from undue control imposed by any other foreign interests. By 2002, over 1.4 million digital divide references to speeches and project descriptions could be found via a Google search.

The concern culminated in the United Nation's World Summit on Information Society (WSIS) in Geneva, continued in Tunis two years later, where 13,000 delegates gathered to discuss the matter. Despite all the speeches and official targets aiming to close the divide at these meetings, no single formula emerged that would effectively address the problem and prevent a widening gap between the haves and have-nots as new technology and Internet access spread into the developing world.

Consequently, the problem has continued to grow in many developing countries. Although the levels of service increase in developed

markets such as North America and Western Europe, there are still businesses and people who can afford hi-tech equipment and fast Internet access and those who cannot.

In Europe, for example, a 2007 report by the Center for Democracy and Technology that examined the current state of technology accessibility in Central and Eastern Europe highlighted the existence of a major divide between urban and rural areas and vast differences between the levels of service one would expect in a Western European Union country.



Source: Ofcom / operators Note: Figures have been restated from the 2006 Communications Market Report to reflect more accurate data

To address this issue the European Union issued a directive that required the appropriate regulator in each country to set a universal service obligation (USO). Unfortunately, in the UK and other parts of Europe, the obligation was watered down and now demands only the provision of a single static telephone line. There is no specific requirement for the performance and type of data service provided. Once again, this simply leaves the consumer at the mercy of the service providers and, if they happen to be in a rural area, this gives them very little chance of obtaining use of high-speed access and services.

The problem is that the European Union sees competition as the only method by which these problems can be resolved. Rather than allowing a progressive local government at the town/city or regional level to develop a strategy in combination with

a number of partners to provide a full end-to-end service proposition, it forces them to build a wholesale solution where the only organisation capable of completing the work is the incumbent provider.

The danger here, for European countries in particular, is that they will be overtaken in the knowledge economy. The EU needs to make some serious decisions over the coming years to make sure that the Asian Tiger economies do not leave Western Europe behind - and there is a real danger that this could happen if something is not done to impose higher levels of USOs.

Rather than setting targets for 'e-inclusion' with woolly statements like 'boosting broadband coverage in Europe to at least 90 per cent', there needs to be change to the USO that provides a minimum 2Mbps to each residential or business property at no worse than 5:1 contention.

However, such a USO would likely cause many an incumbent provider to have a cardiac arrest at the thought of the investment required to provide such service. The problem can be avoided by simultaneously allowing local governments or other organisations to take over the USO from any incumbent with a USO obligation and then use state funding to provide these services, since there is a clear case that the market has

failed. By creating a clear opportunity for innovation in delivery of this USO service, entrepreneurs and alternative networks can compete and build niche solutions that exceed the USO, not in terms of technical requirements but rather in terms of the service.

The danger, if nothing happens, is that the digital divide will mean that rural areas, hit by the fall in the jobs and revenue in the agricultural sector, will be unable to participate fully - reach their full potential - in the knowledge economy. This will leave an ageing rural population cut off from the rest of society, not by choice but by the inaction of the European authorities. The perpetuation of the digital divide and the continuing low service levels in rural areas will ultimately cause Europe to fall behind the Asian Tiger economies. ●



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Hosted VoIP services in Europe

by Konstantin Nikashov, VP, External Economic Activities, MERA Systems & Member, Executive Board, MERA Group

VoIP should grow considerably in the next 3-5 years, as will the market share of hosted VoIP. Europe welcomes hosted solutions more than other parts of the world, but hosted VoIP, even there, is still used mainly by smaller businesses. European service providers expect that the use of hosted VoIP services by large companies will grow given the speed and ease of deployment, the limited capital investment needed, lower operating and maintenance expense and the increasing availability of special features.



Konstantin Nikashov is the Vice President for External Economic Activities at MERA Systems and a Member of the Executive Board of the MERA Group. He is responsible for developing and managing new business partnerships. Dr Nikashov joined MERA as the Vice President for Business Development. Prior to joining MERA, Dr Nikashov was Technical Director for KIS, the first regional ISP in Nizhny Novgorod, Russia and supervised the company's technological initiatives.

Konstantin Nikashov earned his MSEE and his PhD from the State University of Technology in Nizhny Novgorod, Russia.

Hosted VoIP (voice over IP) services appear, today, to be a competitive alternative to premise-based equipment. The rapidly developing market is expected to grow to US\$5.9 billion by 2010 in the US alone, galvanising life into similar processes in other countries. Indeed, hosted VoIP is a type of service advantageous for all parties involved. Software manufacturers, service providers, and end-users that explore the option, find it both beneficial and cost-effective. Manufacturers that design IP Centrex solutions and VoIP softswitches with partitioning capabilities obviously win more customers. Renting out a VoIP solution to other carriers is profitable for the host provider since the business model can be extended to a limitless number of clients. Thinking rationally, enterprises are inclined to use hosted VoIP services, because this choice allows them to save system maintenance and management resources (Figure 1).

To host or not to host: the European view

Although European service providers are adopting hosted VoIP solutions more eagerly than their American counterparts, the VoIP

market in the region today resembles a patchwork bed quilt in terms of bandwidth cost prices, one of the key factors that influence the choice of a host provider. Average bandwidth prices allow a wider choice of

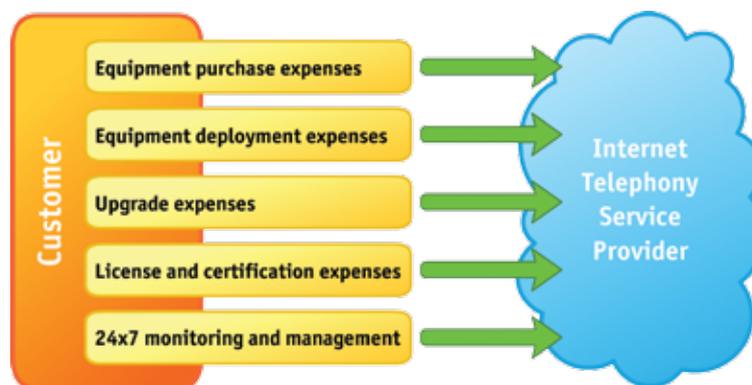


Figure 1. Customer benefits from hosted VoIP

“While small enterprises usually choose to rent a VoIP solution only when some significant event forces them to - end of lease or Centrex contract, or a relocation - larger organizations opt for hosted VoIP solutions to deal with their immediate business requirements without the need to make a sizeable investment in equipment, operations and maintenance. ”

hosts, which makes companies more open minded about the whole idea of hosted VoIP services. High bandwidth prices, as in the UK, often leave companies with just one possible modus operandi - sticking to proven telco leaders. Consequently, enterprises there reject hosted VoIP more easily, if they are not happy with the offer. As a result, proliferation of hosted VoIP services within Europe is now an erratic process.

At the same time, software manufacturers say there is a growing demand for VoIP solutions with partitioning capabilities in Europe. Small service providers that consider the transition to next generation technologies see the proposition to rent VoIP capabilities from large carriers as a low-risk, low-cost way towards communications convergence. Large European service providers have always benefited from hosted VoIP (Figure 2) but they demand high quality hosted solutions to meet the needs of their numerous customers. Moreover, although European software manufacturers have been designing VoIP solutions with partitioning capabilities for years, it is only now that they have started to revise the very notion of hosted VoIP. The proposition has evolved from a cheap offer to a premium one. Slowly but surely, the region is giving in to the temptation of hosted VoIP.

Carriers: play wise - learn to resize!

Initially, the hosted VoIP market has been focused on SMEs (small and medium sized enterprises) and European service providers still stick to this unspoken rule. IP Centrex (Hosted IP PBX) is a service traditionally

popular among businesses with less than 400 employees. However, carriers active in the small business market in Europe face tight competition from cable and other alternative service providers. Therefore, telcos have to look for innovative strategies that help them maintain their market share.

One of the possible strategies is to be very scrupulous about choosing the hosted VoIP solutions they deploy. Apparently, IP Centrex solutions with the most appetizing mixture of features attract more end-users. The ability to offer enterprises advanced features, such as ‘find me/follow me’, integrated with email applications, user-friendly Web interfaces and various dial plans is a competitive advantage for carriers hosting IP Centrex services.

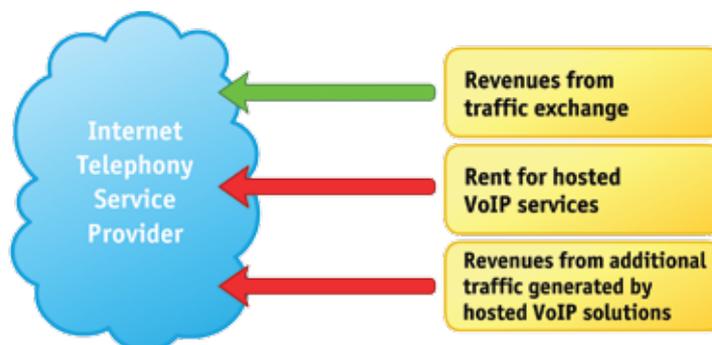


Figure 2. Internet telephony service provider's revenue sources

Another strategy is to reconsider the current business model. Offering a hosted IP PBX to large enterprises rather than to SMEs is becoming more popular in Europe. On the other hand, large service providers often opt to rent out, virtualise, VoIP capabilities to smaller telcos. The latter option seems even more lucrative when host carriers realize that

apart from fees paid by the enterprises they get increased traffic volumes generated by the growing customer base.

Enterprises: a penny saved is a penny earned

Carriers still see SMEs as their main target audience for hosted VoIP solutions, but today's market challenges make service providers broaden their horizons in terms of defining their customers' profile. Small businesses always welcome hosted VoIP solutions. They would rather rent a hosted IP PBX and pay for the number of lines they really use - without incurring additional costs - instead of employing a sizeable IT staff to take care of a premise-based PBX deployment, monitoring, management and upgrade. Large companies might have sufficient resources to deploy their own solutions, but renting VoIP capabilities might also be quite cost-effective for them.

While small enterprises usually choose to rent a VoIP solution only when some significant event forces them to - end of lease or Centrex contract, or a relocation - larger organizations opt for hosted VoIP solutions to deal with their immediate business requirements without the need to make a

sizeable investment in equipment, operations and maintenance. The use by large enterprises of hosted VoIP solutions will certainly begin to grow throughout Europe in the near future. Given the cost advantages, the ease of installation, operation and maintenance, hosted VoIP services are likely to benefit almost any kind of company irrespective of its size.

“At the same time, software manufacturers say there is a growing demand for VoIP solutions with partitioning capabilities in Europe. Small service providers that consider the transition to next generation technologies see the proposition to rent VoIP capabilities from large carriers as a low-risk, low-cost way towards communications convergence.”

Although hosted VoIP is still considered a budding market, European service providers should not be in a hurry to write off the novelty. Once it is treated as a real alternative to premise-based equipment, hosted VoIP brings additional revenues, efficiently addresses market challenges and offers a variety of new business opportunities to explore. ●

Intelligent networks - coping with growth

by Edgar Masri, CEO & Chairman 3Com

The growth of the Internet, indeed telecommunications in general, has put increasing demands upon the network. To better manage network traffic nowadays, network devices such as routers and switches are equipped with sufficient intelligence to authenticate users and devices and provide appropriate secure access, control network priorities based upon the organisation's policies and manage traffic. Open-source applications and standards increases interoperability and reduce costs. The use of intelligence embedded in the network increases network efficiency and helps reduce power usage.



As President and CEO of 3Com, Edgar Masri leads the company's global operations. Mr Masri is also a member of the Board of Directors and serves as Chairman of the Board. Prior to re-joining 3Com, Mr Masri spent six years at Matrix Partners, a venture capital firm focused on technology investments, and also served as Chief Operating Officer at Redline Communications. Earlier, during his first tenure at 3Com, Mr Masri led 3Com's Network Systems Business Unit as Senior Vice President and General Manager. Mr Masri has also served as President of 3Com Ventures, the company's venture arm, and held management positions in Product Management, Marketing and Business Development.

Edgar Masri holds a Diplome d'Ingenieur from Ecole Centrale de Paris, a Master of Science degree in Electrical Engineering from the University of California at Berkeley and a Master of Business Administration with distinction (Arijay Miller Scholar) from Stanford University.

Since I joined the IT industry, I have seen networks become a basic utility as fundamental as the power, lighting and plumbing in a building. Much of this pervasiveness is driven by the rising use of the Internet: now, small and medium businesses as well as global enterprises have their own networks - often secure, converged networks running over IP (Internet Protocol).

The Internet-based IT world, however, moves ever on, and convergence - which used to mean just data and voice over IP running on the same network - is now all about combining applications, intelligence and network optimization to save time, money and effort. It is about knowing where people are without wasting time searching for them. It is about collaborating more quickly and

completely. It is about making it easier to access and manipulate data. It is about a new wave of standardised application delivery platforms that require equipment vendors, application developers and end-users to 'get in the game' sooner rather than later. Fundamentally, it is about creating a virtual, on-demand environment that enables people to get what they need, when they need it. These needs can range from simply accessing data from wherever you are to launching another application to alleviate a bottleneck in the network.

At the heart of the network, switches have developed to cope with the rising demands of Internet-based communications. Basic connectivity and 'wire-speed' performance are now the norm for all switches. The challenge

now for IT managers is how to address future network needs and broader organizational challenges; for vendors, the challenge is how to differentiate their switching and routing products through higher levels of functionality and intelligence. To meet the ever-growing demands of Internet usage, switches must now offer flexibility, scalability and a higher level of intelligence - with the potential to integrate future applications for the benefit of the organization.

Intelligent switches

As all types of communication (voice, video and data) converge onto the IP network, the underlying Ethernet switches have to change and become more intelligent. Currently, most Ethernet switches are simple but highly



“Imagine an intelligent network that authenticates both the user and their device with a single sign-on before they are given any network connectivity.”

effective high-speed forwarders of Ethernet packets. However, the majority of installed Ethernet switches simply do not understand what applications are traversing the organisation’s network, their relationship and relative level of importance, or which user groups need what services since the simple ‘forwarding and forgetting’ of Ethernet packets does not allow applications and media types to be differentiated. Now, however, switches are evolving into more intelligent devices; they ‘understand’ and implement controlling actions based upon the organisation’s desired policies and applications to deliver a bespoke user experience. In essence, we are beginning to see another level of convergence - the convergence of applications, operating system and network infrastructure into highly integrated entities that share information, policy and a single point of management.

Imagine an intelligent network that authenticates both the user and their device with a single sign-on before they are given any network connectivity. Users are given appropriate access rights based upon the

organisation’s desired policies. Convergence devices such as IP phones or IP cameras are instantly identified, delivered power, and placed in separate, secure VLANs to connect instantly to their respective IP PBX or IP CCTV services. Traffic flows throughout the network are controlled based upon policies specifying the application type, link utilisation or cost. This deeper understanding and monitoring of traffic flow enables network managers to use tools to visualise performance and manage infrastructure and application performance levels across the IP network.

New switching technologies

Switching technology is evolving in other ways too.

Power over the Ethernet (PoE+ 802.3at) connections offering between 13 and 70W per port will soon become a reality, offering enough power for pan/tilt/zoom cameras, thin clients, PoS (point of sale) terminals and much more.

A lower cost alternative to fibre, especially in server and storage applications, 10G-BASE-T technology will become widely available, providing 10Gbps operation for up to 100 meters on twisted pair CAT-6 cabling. A cheaper alternative to LX-4, 10G-BASE-LRM (Long Reach Multimode) provides 10Gbps technology over installed FDDI (fibre distributed data interface) grade multimode

fibre. This will give 10G technology a huge boost by lowering the cost of fibre 10G solutions over almost any multi-mode fibre up to distances of 300m.

Triple-speed switch ports with PoE are increasingly being adopted by the market. We have seen growth of 40 per cent per quarter in triple speed PoE. With the advent of 802.11n, high resolution MPEG-4 IP cameras, and IP phones with gigabit pass-through ports, it makes sense for organisations of all sizes to future-proof themselves with a gigabit PoE solution.

We are also seeing a huge take-up of Gigabit switches with fixed 10G ports. The real test is how many customers are buying the transceivers to enable the technology. We have seen a 200 per cent growth quarter-on-quarter for these transceivers, and we predict 10G will be the fastest growing market with the advent of cheaper technologies such as LRM and 10G-BASE-T.

Open source, open standards

As the connectivity, performance and protocols of modern Internet Protocol networks become the norm, the prevalence of open standards increases and drives interoperability, freedom of choice and more competitive pricing.

This concept of openness is now influencing the embedding of network-centric



applications. Networks can be enriched by a rich and diverse set of third party, open source, commercial applications and services. These run seamlessly inside the network infrastructure, enabling organisations to deliver differentiated services, operational simplicity and cost savings, while proactively addressing ever-changing business needs. A significant focus of our technology strategy revolves around leveraging best-of-breed technology and open source applications to differentiate our networking solutions through innovation. This drives a significant change in the networking landscape towards open, flexible multi-vendor integration. Organisations should be able to customize their network according to their business needs to meet changing compliance requirements by deploying best-of-breed applications in a faster, cost effective and less complex manner. Applications and services tightly integrated within the network infrastructure can enable unparalleled flexibility, visibility and control of network traffic and application performance.

The world is warming up to applications like OpenOffice and open standard operating systems like gOS the new Google operating system. More users and enterprises are now focusing on software that can provide high-level IT service for the lowest cost in terms of deployment and support.

Where network services like security, voice, video and management functions

are concerned, the same trend is emerging. Today, enterprise users can deploy enterprise class open source network services on servers to throttle bandwidth and provide denial of service mitigation. And, just as commercial firewall and VPN software have moved into appliances and then to the network switch fabric, the same is happening for open source network services as well.

Network services are moving into the switch fabric because server-based services running on operating systems often lack performance; to overcome this, a growing number of dedicated high performance appliances are installed and the appliances start stacking up physically creating an appliance glut that is tough to manage.

Environmentally friendly switches

There is also a trend towards environmentally friendly networking products. An estimated two per cent of all carbon emissions originate from IT and networking equipment consumes 13 TWh (terawatt hours) of power per year. Networking can contribute to greater power savings. The IEEE is working on standardising an interoperable technique that involves reducing the transmission speed of a network link when it is not being fully utilised. For example: if utilisation of a 1Gb/s link is less than ten per cent, the link rate can be reduced to 100Mb/s then brought back up to 1Gb/s when the utilisation increases again.

Since links rarely operate at their maximum capacity, five TWh of power a year could be saved in the US alone by universal adoption of this technique. This helps meet the demands of increased Internet usage in an environmentally friendly way.

To meet the challenge of future network needs in an increasingly Internet-dependent world, switches must offer greater flexibility and scalability, a higher level of intelligence and the potential to integrate future applications. The networking industry is therefore heading towards using secure converged networks running over Internet Protocol. Three technology trends drive this change. The first involves using VoIP (voice over IP) for a wide range of applications such as WAN optimization and application acceleration. The second trend involves bringing more value to voice and other applications such as DBMS and ERP by driving them into network infrastructures. The third trend will involve virtualization of the networking environment to create a true on-demand ecosystem, utilising the Internet as a communications vehicle.

Ultimately, end-users can exercise the power of the purse by insisting that network suppliers provide the open, standardized solutions that best enable them to meet the rising challenges of Internet usage. ●

Growing the Net in the Balkans

by Dino Andreou, CEO, OTEGlobe, Greece

Internet penetration in the Balkans, although still quite low compared to the rest of Europe, is growing due in large part due to the stimulus provided by the accession of Romania and Bulgaria to the EU and the desire of other countries to follow their example. Wholesale international Internet carriers have a big role to play in the development of the Balkans, providing high-capacity connections to the rest of the world at a reasonable price to drive local development.



Dinos Andreou is the CEO of OTEGlobe. He joined OTEGlobe at its start-up as Chief Financial Officer. Mr Andreou is also a member of the Board of Directors of OTEnet Telecoms Ltd, Cyprus. Prior to OTEGlobe he worked as Financial Director for Global One Communications Hellas S.A., responsible for finance, human resources and legal issues. Mr Andreou began his career at Coopers & Lybrand, where after continuous promotions both in the Athens branch and London's headquarters, he was assigned a senior management position.

Dinos Andreou holds a BSc in Mathematics with Operational Research and an MSc in Operational Research, from the University of London.

The broader Balkans region is undergoing massive change. The EU accession of Romania and Bulgaria, and the strong intention of the other countries in the region to become members of the European Union as well, has significantly boosted the development of this European region in every way.

Regarding new technologies, the mobile penetration of more than 90 per cent clearly marks mobile telephony as a dominant trend. Fixed line penetration, however, is lagging significantly, especially in the rural areas. In this context, the Internet usage penetration rate in the broader region is behind that found in the rest of Europe. The broader Balkans region includes the following countries: Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Greece, FYROM (the Former Yugoslav Republic of Macedonia), Moldova, Montenegro, Romania, Serbia,

“From the perspective of an international wholesale telecommunications carrier, this region and its Internet growth is a challenge worth rising to. The region’s Internet service providers’ need for high capacity connections to the Internet Exchanges in Western Europe is immense.”

and Turkey. More specifically, the weighted Internet penetration in this region is 24.8 per cent, while the respective figure for the rest of Europe, according to Internetworldstats is 43.4 per cent and the world average is 20 per cent.

It is obvious that there is significant room for growth. This is verified by the respective compound growth of the penetration rates for this region between 2000 and 2007. The usage growth rates range from 280 per cent for Greece, the most developed country in

the region, to 18.748 per cent for Albania. This boost has been enabled by the rise of the broadband connections in the region specifically during 2007.

From the perspective of an international wholesale telecommunications carrier, this region and its Internet growth is a challenge worth rising to. The region’s Internet service providers’ need for high capacity connections to the Internet Exchanges in Western Europe is immense. This need is driven by the increase in broadband penetration, which

“Another important requirement of Internet service providers (ISP) in the region is low-cost international Internet transit. This is mainly driven by the tight cost constraints they face in their local markets where they rely mostly on the incumbent operators’ networks for last mile access to their end-users’ households. In addition, to balance the need for cost effectiveness with the need to offer high quality service, they wish to be able to upgrade easily whenever needed, based on very short-term forecasts for international bandwidth.”

in turn has boosted the usage of consumer and corporate IP-based services. Needless to say, the bandwidth needs of websites like YouTube and MySpace to enable video and audio streaming has also had a big impact on the demand for capacity. This is reflected by the forecasts for growth of IPTV services, as well as video on demand (VoD), in the region. In line with this trend, the need for international Internet transit services in the region is growing. Internet service providers require high-capacity links to the main Internet exchanges and the ability to easily and cost effectively upgrade to handle higher volumes. Forecasting in times of rapid growth is difficult, especially if the Internet provider wants to offer Internet access to its end-users with better than average quality of service.

In this context, the international wholesale markets in the Balkans are transforming rapidly, creating significant opportunities and challenges. The need for new fibre optic network infrastructure to connect the Balkans and the Middle East with the main European telecommunications hubs is clear. Addressing these needs, regional carriers have launched a new fibre optic infrastructure, with capacity of up to ten Gbps (Gigabits per second), to connect Greece and the broader Balkans region to Frankfurt.

Nevertheless, it remains to be seen if the investment of international wholesale carriers in new infrastructure will be enough, on its own, to rise to the challenges of the Net’s growth and meet the customers’ requirements.

In order to meet this need, close attention has to be paid to the requirements of Internet service providers in the region. The most important issue is network availability, and this is a message that carriers are getting from the service availability rates that customers expect in the service level agreements (SLAs) they insist upon. This issue was highlighted by the recent cuts of the submarine cables in the Middle East and Asia Pacific that left countries without Internet access for considerable periods. In other words, due to the increasing importance of the Net in everyday life, the failure to provide Internet service is causing serious distress in many ways, including financial and social. In order to ensure the best possible network availability, a carrier has to offer

not only physical, but also geographical network diversity, if it is to guarantee service availability of 99,999 per cent.

Another important requirement of Internet service providers (ISP) in the region is low-cost international Internet transit. This is mainly driven by the tight cost constraints they face in their local markets where they rely mostly on the incumbent operators’ networks for last mile access to their end users’ households. In addition, to balance the need for cost effectiveness with the need to offer high quality service, they wish to be able to upgrade easily whenever needed, based on very short-term forecasts for international bandwidth. In order to meet these customer needs, carriers must be able to offer the right price and respond quickly to the rising demand for capacity. The most effective way for the international carriers to achieve this and remain profitable, is to attract the highest possible volume of traffic on its networks. Services such as Ethernet access for Internet transit should be offered in order to facilitate the flexible capacity upgrades that customers may require.

In this context however, and as an IDC report on the region (SEE Europe Wholesale Analysis, July 07) states: “The opportunities are bringing new competitors with large plans for the region, having an impact on prices, profitability and the shape of the market. The new competitors and their large investments are pushing down prices rapidly, limiting growth of the actual value of the market.” As a result, market growth in terms of revenues is growing more slowly than the growth of the capacity needed.

This is an issue that carriers in the region have to deal with to profitably rise to the challenge of the Net’s growth. Over-investment in networks has to be avoided; it must be replaced by partnerships among carriers that will end in a win-win situation for all members of the value chain. This will lead to healthy competition, which in turn will result in:-

- Carriers offering high quality of service and network availability to ISPs at a fairly low price that will enable them to operate their networks profitably; and

- ISPs being able to compete aggressively by offering higher connection speeds and quality to their end users at better prices due to the improved cost structure.

Hence, in order to rise to the challenge of net growth in the broader Balkans region, all the involved parties have to work together to ensure that the needs of service providers, wholesalers, retailers, and end users are met successfully. Isn’t this the spirit of the Net after all? ●



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Network evolution - rising expectation

by Fotis Karonis, Chief Information Officer, Romtelecom, Romania

Throughout the world, the telecom sector is changing radically in response to changing technology and rising consumer expectations. The traditional voice-centric business model is rapidly becoming a recipe for disaster. To survive in today's market, operators need to adopt an innovative, value-added, service-oriented and customer-centric strategy. The collaboration trend means that customers no longer just consume content - they create and share it. They often upload as much as they download, share content with friends and participate in communities.



Fotis Karonis is the Chief Information Officer of Romtelecom, Romania. Prior to Romtelecom, he worked at the Athens International Airport as Director of Information Technology and its Telecommunications Business Unit; he was also a member of the Board of Executives. Previously, Mr Karonis worked for Cap Gemini, France, and Cegelec - Alcatel, France.

Mr Karonis graduated from the Electrical Engineering and Computer Science department of the University of Patras in Greece and earned his MSc in Digital Electronics & Systems from the University of Manchester, Institute of Science & Technology (UMIST).

The changing ecosystem

Today, the growth of the net is creating big opportunities, but also significant challenges for all players involved. Telco operators, manufacturers, IT providers, cable operators, the media, all are trying to position themselves with new services and solutions within this fast changing ecosystem. The common characteristic today is that the customer or consumer is at the heart of the network business, and largely dictates the business models of all the players struggling to capture the entire relationship with the customer.

The content providers are expanding their services in the telco area and are influencing the technological layer. The end devices with which producers are integrating ever more features and technologies in consumer products, are generating new applications

demand and bandwidth capacity. The telco operators are trying to adapt their business value proposition, evolving in all the areas of communication services and integrated solutions, fixed, mobile, broadband, content, and IT solutions. The principal challenge for the operators is to be competitive, excelling in customer satisfaction and in providing effective and innovative end-to-end services to the market, consumers and businesses; and they must rise to the challenge of usage growth and new demands of the customers.

The heart of the Net

The Net offers a unique opportunity for each consumer to be part of a world of diverse interaction, of content and knowledge, diversity of business activities and people networking. The needs of Internet consumers include improved education, the ability to interact, to innovate and contribute and collaborate as needed.

The customer is the heart of the Net. Today's user demands more and more interactivity

“The content providers are expanding their services in the telco area and are influencing the technological layer. The end devices with which producers are integrating ever more features and technologies in consumer products, are generating new applications demand and bandwidth capacity.”

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to find the proper information, interact with the content and change it, communicate with friends, participate in social networks, play games or buy online. This is the pulse of the Net consumer! Everyone wants to engage in a great number of activities simultaneously from whatever device they happen to be using, without needing to know about - or even be aware of - the underlying technology the service is based on.

Collaboration

The real promise of collaboration technologies lies in supporting new ways of working and interacting. It is a shift to a connected society of interaction, learning and knowledge exchange. For the corporations, it means a dramatic improvement in the capacity for innovation. To understand where collaboration technologies are heading, a different framework characterises collaboration, based on the attributes reach and awareness. The combination of reach with awareness is the true generator of innovation, knowledge, for societies, as well as for corporations.

One important trend in the communications world today is that customers are not simply consuming content. They are creating and sharing it as well, establishing digital communities based on mutual interests. People are interacting more and more and becoming integral parts of an extended social ecosystem. Yesterday's thinking was about 'customers'; today's thinking is about 'communities'. Understanding the customer means understanding the customer as part of a social community.

Volunteers create all of Wikipedia's content; it is now the ninth most visited site on the Net. The Wikipedia exemplifies one type of expanded reach: the ability of an individual anywhere in the world to create content in collaboration with tens, sometimes hundreds of others. YouTube gives consumers the capability to seamlessly share content in a manner almost impossible not so long ago. The evolution of social networking demonstrate another flavour: expanding one's social network in preparation of potential future collaboration. Facebook and MySpace provide a range of tools for increasing both reach and expanding social networks and staying in touch with what is happening in those networks.

Telco business models

There is clear perception in the industry that the future for telecommunication operators should not be just providing connectivity.

Telcos need to advance on the value chain to provide more value and service for our customers. From a technology prospective, integrating fixed and mobile capabilities is an essential foundation of success. From a service prospective, providers need to be innovative and creative, driven by a sense of what the customers want and need. Another key element of customer-driven innovation is the move towards integrated converged services, so customers can use any device they choose to satisfy both their personal and business communication needs.

To do this, telcos need to adopt high technology where the line between traditional network and IT technologies is blurred. Significant investments are required in next generation convergent solutions, to meet customer needs for the increased bandwidth needed to support new services and interactive content in a secure and transparent way.

The complexity of this constantly evolving process is extraordinary, as the demand for speed, for bandwidth - at lower prices - is growing dramatically. For example, after cutting ADSL prices by 50 per cent, the Romanian incumbent recorded a 280 per cent increase in its broadband market share in 2007. Innovations in video, voice and data services are changing the way we live, work or play. A new world - a virtual one, without borders, without limits - promises great challenges and many opportunities. This calls for service providers with both well-defined long-term strategies and the agility to adapt.

Added value, innovation and efficiency

Differentiation and innovation are key elements of success in today's highly competitive world. We can find a clear example in the automobile industry, where companies that invested in innovation and cost effectiveness succeed, while their competitors are at the brink of extinction. Another example of differentiation is coming from the aviation industry with distinct high-end travel service offerings and low-cost travel with minimal services and self-service passenger processes.

The telecommunications industry is no exception. Telcos must take the message to heart. Service innovation and cost effectiveness are key elements for success. Telecommunications companies should continuously offer innovative products while, at the same time, improving their efficiency. They need to develop new hunting techniques driven by innovation and customer-centricity. By keeping in mind what made them

successful in previous technology eras - their knowledge of the customer - communications companies can position themselves for high performance, regardless of the challenges that lie ahead.

Continuous change is the answer - a permanent process adaptation and cross-functional interactivity, provides the competitive edge. The vision and the strategy should be clear - excellence by innovation, adaptability, customer focus and success.

A new class of truly agile organisations, the globally integrated enterprise, is emerging as the winner. How? By delivering unique value, tapping into the power of globalization and forging a strategy of componentization. These organisations understand that using service oriented architecture (SOA) is a preferred method of delivering sustainable agility, the ability to quickly and effectively respond to changes, opportunities and threats, to be able to compete effectively.

Convergence and end-to-end integrated services to the customer will be the key of success. A key driver for convergence is network efficiency. Traditional networks were simply not designed to support the explosive growth in customer demands and the continuous rollout of new products and services. To address the new challenges, next generation technologies and highly adaptable architectures need to be built. Telcos often embrace service-oriented network design with a modular highly scalable approach; this lets them quickly adapt and scale the network infrastructure itself, to support new services and future growth.

Continuous self-improvement and innovation should be among the objectives of any strategy. Technology, changes in the corporate culture and processes, customer focus, simplification and optimization are all equally important sources and multipliers of innovation. A customer-centric and cost-oriented culture, agility and education also help sustain an organisation in a competitive market and to keep it alive. Strategic alliances and partnerships with other players can bring competitive advantages, agility and jet-like performance in an age where speed in the marketplace is all.

Competitive excellence is a must these days. In order to be part of the Net culture, all key elements of the organisation should be orchestrated to deliver excellence and customer value. ●

Mobile broadband - the future of broadband?

by Victor Donselaar, President, Movial Applications Inc

Mobile broadband is growing rapidly in all parts of the world, not only for mobile phones, but for PCs as well. Many operators expect wireless broadband revenue to exceed those for fixed broadband as early as this year. Unfortunately, when mobile broadband is offered without bundling additional value-added services, it becomes simply a high capacity low-priced commodity. One way to escape this fate is to offer value-added bundles with Internet services, real time messaging, voice or even video.



Victor Donselaar is the President of Movial Applications Inc. Before assuming his current position, Mr Donselaar was in charge of global sales at Movial. Prior to joining Movial, Mr Donselaar held business development, sales, communications, and team management positions in global technology services and consumer electronics companies.

Mr Donselaar holds a M.S. degree in business administration from RSM Erasmus University, the international business school of Erasmus University Rotterdam, and studied Telecommunications and Business at the Helsinki School of Economics in Finland and at Prague University in the Czech Republic.

Affordable mobile broadband for PCs will be the next big service wave to catch on. It should grow rapidly - even in the saturated markets of Western Europe. From an end-user perspective, mobile broadband PC service is easy to buy and use and from a mobile operator perspective, it is easy to market and sell. If you have been to the MWC, CeBIT, CTIA or any other of the countless shows this year, then you will surely have heard a recurring theme that is both a warning and an opportunity for carrier Chief Marketing Officers to heed. Their role in the carrier organisation has just become critical to the emerging success and promise of mobile broadband - because the issues are not technical, they are marketing related.

The CEO of DNA Oy, the Finnish competitive operator, Riitta Tiuraniemi recently said that DNA expects ten per cent service growth in its customer base of 1.3 million subscribers by the end of 2008. And Finland isn't the only market where mobile broadband is picking up steam. Telecom Italia Mobile's CEO, Marco De Benedetti stated in his keynote at Mobile World Congress (MWC), that he expects wireless broadband revenue to exceed fixed broadband in three years - equipment vendors applauded wildly at this point. Ericsson's Chief Marketing Officer, Johan Bergendahl in a keynote at the European Computer Audit, Control and Security Conference in Stockholm said that, in Austria, mobile broadband usage will overtake fixed broadband this year. It is already growing faster than fixed broadband,

and in Sweden, the most popular phone is a USB modem. Mobile Broadband presents a unique opportunity for carrier Chief Marketing Officers who are listening.

Flat prices for fat pipes

The emergence of the PC as an end-user device for mobile data services is the main driver of this new traffic growth. Hamid Akhavan, CEO of T-Mobile, expressed concern over decoupling the cost per bit from revenue per bit at CeBIT NGMN (Next Generation Mobile Networks). He said it was only going to be a matter of time before mobile data is no longer profitable for operators. In the past, user experience was driven by the average traffic on a cell site.

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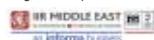
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“Combining broadband content with the sale of IP Communications services and devices drives additional revenue. This model is already used successfully today and sets a new mobile broadband and IP communications service standard. Far EasTone (FET)’s Big Broadband not only addresses mobile broadband access, but provides an elegant array of value added services that are created by the combined offering.”

If we look at Korea’s saturated fixed broadband market with its heavy competition and traffic explosion, we can see how the CAPEX/OPEX burden is difficult to offset with flat prices. After a few years of mobile broadband growth, ARPU (Average Revenue per User) will flatten out completely and the increased cost per Kbps (Kilobits [or thousands of bits] per second) will send operators into a tailspin desperate for new revenue sources.

In fact, many mobile broadband services today are offered without any additional associated revenue-generating service. Once the market is saturated, this model will lead customers to seek the flattest price with the fattest broadband pipe.

Who is leading the herd to deliver mobile broadband at a flat rate? The answer lies within the operator communities’ business minds - with those who have been blinded by the short-term success they have seen with mobile broadband. The shining growth, though, is not so luminous up close. At this point in mobile broadband’s emerging state, it is absolutely critical for the CMO to consider the future implications of the flat rate business model to mobile voice and messaging revenues. A customer is likely to keep using their IP Communications services from Skype and MSN on mobile broadband, just as they do in fixed broadband. Such blind reliance on Skype and MSN bodes badly for operator leverage - it effectively hands the keys to the kingdom to the newcomers like Skype, MSN and other Internet players.

Selling communications and mobile broadband

The first challenge for the CMO is to effectively convey the benefits that Internet services represent to the responsible P&L unit managers and their own marketing people. Three key market forces must set the context for further discussion:

- The Internet paradigm is unstoppable;
- Communications and Internet-originated media are merging. The fruits of this merger will fall into the hands of the operators or Internet players. Controlling just one or the other will lead to commoditization of

the offering. The players who successfully provide a combined offering win; and

- Operators will have a fighting chance if they work with technology and business partners that understand the Internet paradigm from a communications perspective.

Understanding these market forces is critical to an effective mobile broadband communications strategy. The resulting service offering - a skilful bundling of communications and media content - must be simple to use end-to-end and offer real value to end-users.

A case study

Combining broadband content with the sale of IP Communications services and devices drives additional revenue. This model is already used successfully today and sets a new mobile broadband and IP communications service standard. Far EasTone (FET)’s Big Broadband not only addresses mobile broadband access, but provides an elegant array of value added services that are created by the combined offering. The FET service combines mobile broadband, a mobile router, and a converged set of IP communications services for both PC and mobile devices. Unlike Skype’s offering, FET’s service has benefits like one phone number for all devices, voicemail, and ring back tones. The service offers the inexpensive call rates that have made Internet competitors successful, but now FET can offer the same services over different devices with the exact same user and brand experience. In addition, FET services come with post-pay billing and tech support that customers love - and that Internet competitors have never understood.

FET’s Big Broadband is an example of a successful launch - where new subscriptions to their mobile broadband service have grown significantly and the FET bundle generates additional revenue with their IP communications subscription. FET’s smart marketing campaigns consist of large-scale TV advertisements, print materials together with an altogether compelling website. A rich, fully branded user experience, compelling pricing, ease of purchase and a successful marketing launch now positions FET as a market leader in the mobile broadband IP

communications business - something that didn’t seem possible a year ago. The key to FET’s success was spending upon marketing to build a critical mass of consumers to drive big returns.

The opportunity

Today, operators have an enormous opportunity to expand the use of their existing assets by combining them into rich offerings. Success is predicated on the ability to focus on end-user needs and the ability to think beyond the initial success of mobile broadband. Operators that continue to promote service silos - single services tied to a single subscription - will fail. Services that only function on a mobile device, but not on a PC, will fail. CMOs have to market services that are easy to use and well integrated.

How can you leverage existing communication and Internet media offerings into new, value-added bundles? One way, is by enabling consumers to communicate their Internet experiences in real time, via messaging, voice or even video.

Sharing Internet content via email is an old paradigm, a solution that is both asynchronous - and often of limited use if the receiver gets it hours later. The new paradigm enables instantaneous content sharing, so the sender can read, hear or see reactions in real-time. When the operator does this in a seamless and easy-to-use fashion the world becomes a lot more interactive and revenue producing.

Social communications will further differentiate IP communications offerings and push demand for mobile broadband. It is simply a matter of placing the end-user first. CMOs have to focus on making mobile broadband easy to sell by providing consumers with the best possible user experience and by collaborating with partners who are successful in other markets.

The warning is loud and clear, don’t wait another quarter or you’ll be handing the reigns over to the Internet providers, but the opportunity is even louder and clearer, the player with an effective mobile broadband communications strategy and service offering wins. ●

Screen companies

by János Winkler, Chief Operating Officer, Magyar Telekom Ltd, & Head, Customer Business Unit

The Internet is rapidly occupying TV, computer and cellphone screens and broadband fills these screens. Third Generation - 3G - wireless and HSDP deliver true broadband to mobile phones. The cell phone is the first personal mass medium. More than 2.6 billion people have cell phones. In the screen-dominated 21st century, broadband enabled mobiles will connect us constantly to our real and virtual communities. The iPhone, the first real screen phone, already puts Apple among the top ten handset manufacturers.



János Winkler is the Chief Operating Officer of Magyar Telekom Ltd and Head of its Customer Business Unit. Previously, Mr Winkler served in a series of posts including CEO, Head of Mobile Services Line of Business, and Deputy General Manager & Chief Marketing and Sales Officer for T-Mobile Hungary Ltd (formerly Westel Mobile Telecommunications Co. Ltd.). Before joining T-Mobile, Mr Winkler was the National Sales Manager, later Deputy General Manager & Director of Marketing and Sales for Westel Rádiótelefon Kft, Budapest, Hungary and Sales Manager for the Nikex Foreign Trade Company. He also served as the Commercial Secretary, Deputy Commercial Counsellor, in the Commercial Office of the Hungarian Embassy in Peking, China.

Mr Winkler graduated as an Economist, from Budapest University of Economic Sciences, and also holds a MBA from Perdue, USA.

When we tap the word 'Internet' into the Yahoo search window we get a long list of descriptions, explanations and theories. Although we can talk about wires, servers, routers and modems, the World Wide Web is much more than a spider web of hardware. The Internet is a system to turn our fundamental needs, our desire to belong to a community, free communication and self-expression, all organized into bits. It is a knowledge base and an entertainment and communication interface. It is starting to dominate the screens of computers, cell phones and, soon, through IPTV, of televisions. The Internet is taking (has taken?) control of our lives by connecting us to the world. In today's society, it is rapidly

occupying the three most important screens in our lives - the TV, the computer and the cellphone. The task for operators is to conquer these screens.

Darkness without broadband

The screens cannot survive without content - content in the broadest (band?) sense. Content is everything on the Net, every sort of information and multimedia flow and, in fact, every digital transmission - everything with a network connection. Nowadays, living without broadband means returning to text, to grey monochrome displays and the limits of the pre-digital world. Colours, information, email and chat, browsing and video file

sharing do not exist without the electronic highway. The digital age does not tolerate the sort of lengthy waiting we had back when we surfed the Net on a dial-up modem - delays long enough to finish a cup of coffee in the kitchen. Fortunately, those days are now (almost) history - you can surf the Net, even watch the news, on your cell phone while waiting for a bus.

Broadband Internet connections have shaken-up the screens of the world. Increasing speed and new generations of computers have laid the foundation for the emergence of web 2.0. Just where would YouTube - responsible for an estimated ten per cent of the Net's traffic - be without bandwidth? How could we upload our video files and watch the videos without

Getting a Handle on Web 2.0 and the New Services Development Paradigm



by John R. Janowiak, President, International Engineering Consortium

What exactly is Web 2.0? How relevant is it to the service provider business model going forward?

The short answer: very relevant. Carriers who remain focused on traditional voice services and video are missing the larger transformational drift of the communications industry. It's no longer just about service providers inventing services and then selling them to customers; it's about platforms on which customers share communications and entertainment experiences with one another, building ever-larger communities of friends, colleagues, and customers.

A New Paradigm for Services Development

If anything characterizes the Web 2.0 world – and, by extension, the new soft service provider world – it is openness. In order to interact richly with colleagues, friends, customers, and business partners, end users are pushing a model in which: 1) they have a hand in developing and defining the services they themselves want, and 2) interacting with the network itself is easy and efficient. This is the end game of the network-as-software model - one in which software and applications live on the network, are accessed by the network, and indeed are created via the open-access network.

For example, at SOFNET 08 – a new conference produced by the International Engineering Consortium in April – Microsoft will discuss its Connected Services Sandbox as an example of this new paradigm. Through Sandbox, operators can open their networks to next-generation Web 2.0 applications that can be mashed together with traditional services to create new connected services. The goal is to facilitate the rapid development and market deployment of

new service offerings, creating new opportunities for participants and delivering new options for consumers and businesses.

“In the new soft service provider environment, operators will be able to offer hundreds, if not thousands, of new services that enable them to target specific customer segments, reduce ‘churn’ and drive new revenues.” says Michael O’Hara, general manager for the Communications Sector at Microsoft. “By embracing the principles of Web 2.0 and leveraging the significant customer relationships and assets they already have in place, operators have the opportunity to redefine the models for doing business.”

Charting a Course Forward

“The innovation genie is out of the bottle,” said Matt Bross, Group CTO for BT, in an interview recently with Light Reading. “We need to do more mash-ups, and we need to connect together for innovation. There are major innovation possibilities by opening up collaboration opportunities. We’re moving towards a real-time global innovation model... [and] moving from a closed to an open model. It’s a big challenge.”

Getting a handle on these mash-ups (that is, creating a new service by putting together two existing ones) as well as opening the network to third-party innovators, is the course forward according to Bross, who will serve as overall conference chair at SOFNET 08.

“We need to change our mindsets and focus on how we can enhance the quality of people’s lives and how they do business,” he said. “We need to innovate at the speed of life.” ●

high-speed web access? The mobile Internet and mobile displays exist only as a function of bandwidth.

The mobile industry has been feeding users false promises about bandwidth for too long in the name of General Packet Radio Service (GPRS), and then Enhanced Data rates for GSM Evolution (EDGE). When 3G and High-Speed Downlink Packet Access (HSDPA) arrived, everyone was sceptical, based upon the experience they, and their friends, have had with mobile broadband in the past. Advertising EDGE as broadband damaged the industry's reputation, but trust can be regained. HSDPA, for example, delivers true broadband and real freedom of communication via cell phones and computers.

Today, if you need fast Net surfing, there is life outside the desktop. Thanks to real broadband, we have reached a point where people of every generation are seen staring at displays on their cell phones or computers while walking the streets or sitting in parks and cafés - I do this as well. If I need to check something on the Web, I no longer wait to get home, since my mobile phone is at hand. I wonder; should we still call it a telephone?

We no longer have to wait to satisfy our curiosity - we have the Net and powerful search engines in our hands. Who hasn't stolen a few idle minutes on the Internet, turning on a notebook or BlackBerry; we surf the Net, exchange emails, chat, blog or log onto our favourite forum while waiting to catch a bus, board a flight or ride a tram. We also share anything we see or hear - we take pictures, shoot videos and share them via our mobiles.

Web 2.0 - a screen for everyone!

Web 2.0 comes into its own on screen - on computers and increasingly on cell phones. Mobile Internet users can, and do, share what is happening in their lives; they connect and transfer their experiences to others, as they happen, from their mobiles - compressing time and space.

Web 2.0 takes on its real meaning in the totally networked world of mobile communications. The cellphone is the first real mass medium - a personal mass medium. There are 2.6 billion people with cell phones in their pockets. Throughout the world, the mobile screen reaches children and senior citizens alike. It is the first mass medium that can be easily personalised. Mobile is growing more rapidly than any other medium before

and is creating a personal attachment never seen with other mass media.

T-Mobile Hungary and the Hungarian Academy of Sciences have studied the social effects of mobile telephones for years. They have investigated how mobile communications change our lives. Their studies and those of international researchers show that our strong attachment to mobile telephones derives from the social interactions, the person-to-person relations, mobile telephones make possible in an urban world.

With a mobile phone in hand, our family, friends, co-workers and acquaintances are only the push of a button away, no matter where we are in the world. We contact whomever we want directly; there are no intermediaries, and we do not have to leave a message - we can dial them directly wherever they are. This is natural now; we do not think about it, we push a button and start talking.

World Wide Webs of individuals, communities, are growing on the Internet and the mobile phone will soon keep all of us constantly connected to our own



communities. A network of person-to-person and individual-to-community relationships is replacing person-to-person relationships, and the mobile telephone will become one of the most important connections to real and virtual communities in the screen-dominated 21st century. In much of the world there are few computers and no landline infrastructure, so cell phones - Internet enabled handsets - are the only way people can access the Net. With the spread of broadband mobile networks, the last obstacles are disappearing; access to information, to Web 2.0, to images and sound will be via a screen in our pocket.

A new experience

We are at a turning point; the world can finally become a real community with the help of mobile tools and broadband mobile Internet. The concept of the World Wide Web - a truly global network of people - is becoming reality. We are just starting; manufacturers now understand we need more than just a simple equipment facelift to consolidate the revolution. Today the screens are often scary and hard to understand; buttons, menus, user interfaces are often incomprehensible and illogical. All handsets present obstacles that

keep the screen-controlled web 2.0 from enhancing our sense of 'community'. When broadband mobile was launched, we often heard voices of doubt: 'Make no mistake, the mobile Net will end up as WAP did. Who is going to surf the Net with such a small screen? It is slow and unmanageable.' Despite the doubters, speed is no longer an issue, and the tools - the handsets - are getting better and better. Cell phones have become smarter, but the user's manuals have become thicker and harder to understand. Our handsets have so many functions they are often difficult to use.

It is no coincidence that in the recent Mobile World Congress in Barcelona, in forums and workshops of manufacturers and operators, one issue stood out - the user experience. Users want attractive and trendy handsets that provide services they really need and can easily use. The iPhone is a case in point; I was very impressed when I first took one in my hand. Within minutes I was convinced it is an excellent handset, a real 'screen-telephone'. Its voice performance is perfect, but it is not optimized for voice - this telephone is all about the screen and content on the screen, voice is secondary.

Although the iPhone cannot do everything that some state-of-the-art cell phones offer, it has completely revolutionised the cell phone market; Apple, with only one relatively expensive handset, is already said to be among the world's top ten handset manufacturers. It is not surprising; the iPhone is the first real screen phone. It is very revealing that German iPhone users use 30 times as much data as an average customer! For them, mobile Internet is no longer a novelty; rather it is an essential tool, an essential experience.

Success and screens

The bottom line for operators, indeed for users as well, is what can be found on their screens - on televisions, computers and mobile phones - perhaps all three simultaneously. Can we provide a Web 2.0 experience that people feel, love and enjoy on the new screens? The success of operators will be measured against that.

Operators succeed whenever a subscriber chooses its screen among the many available. Operators succeed when the user's experience bonds users to them through millions of screens. ●



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The Wireless broadband revolution

by Peter Ziegelwanger, Managing Director, WiMAX Telecom GmbH, Austria
and CTO, WiMAX Telecom AG, Switzerland

The Internet is becoming an indispensable tool for many; the demand for mobile Internet access is simply the latest manifestation of its growth. People want access, wherever they are, not only to voice, but to broadband for business applications, and for everything to social networks, videos, live TV, and entertainment of all sorts. Existing mobile networks and mobile devices cannot handle the traffic efficiently. The next generation of handsets and devices will be WiMAX capable for high-speed Internet access.



Peter Ziegelwanger is the Managing Director of WiMAX Telecom GmbH in Austria and CTO of the WiMAX Telecom Group. He has more than 15 years' experience in the telecommunications business.

Mr Ziegelwanger held several executive management positions in operations and sales in telecommunications companies such as Ericsson Austria, Airpage (CTO), RSL COM Austria (COO, now eTel Austria) and Memorex Telex Communications AG (COO). His last position was as Head of International Carrier Management in Telekom Austria.

Peter Ziegelwanger graduated in Civil Engineering and Atomic Physics from the Technical University of Vienna and has an extensive technical background in the telecommunications sector.

Changes in telecoms

The telecoms industry has experienced many changes in past years, from market de-regulations and the boom years of mobile telephony to the Internet hype. The fixed network voice telephony market is saturated and mobile networks now carry more traffic than fixed networks. This was a natural evolution, built upon the convenience of the small, portable, mobile phone handset that users carry everywhere, at home and abroad, so they can be reached at their personal phone number anywhere and anytime. The freedom and convenience of mobile telephony has driven its acceptance around the globe. Today mobile telephony is an inseparable part of our lives, despite its occasional inconvenience.

The Internet brings a similarly pervasive experience and we use it constantly for business and personal matters. Certainly, its main use is for business, but it also plays a significant role in our private lives. In many instances, we cannot work without an Internet connection, although we might be able to work without a telephony connection for a while. Not being able to send and receive emails gives some business people today the feeling that they cannot do their job properly.

The Internet was originally used to access information; it has improved private and business services such as online banking, trading stocks, government services and the like. Today email, a person-to-person communication utility, is the most widespread

Internet application for both business and private users.

The demand for Internet connectivity has resulted in significant growth rates for broadband access. Incumbent operators tend to provide broadband access based on the existing copper line infrastructure; they use digital technology (DSL - digital subscriber line) to increase the data transfer rates over standard fixed voice lines. Cable TV operators are another group of operators that have residential access infrastructures. Many have upgraded their networks so that, in addition to (unidirectional) broadcasting, they can handle bidirectional traffic for high bandwidth Internet access.

Internet usage

The need for broadband, high-speed, Internet connectivity is mainly due to bandwidth hungry applications, big volume content distribution and machine-to-machine communications. Having said that, voice telephony has increased whenever it has been made easier for people to use, as with mobile telephony. The introduction of new technologies, though, tends to drive the growth of data volume. Today, given the high-speed access available, users have little notion of the volume of data they are sending and receiving on the Internet. Most of today's advanced software just 'assumes' it always has on high-speed broadband Internet access.

There are natural, physical, limitations on voice communications, but machines do not have the same limits; Webcams, for example, can produce an enormous amount of data depending on the resolution and streaming system used.

Today, social networking is growing on the Internet. Platforms like YouTube, Facebook and MySpace allow multimedia communication between individuals and groups wherever they may be in the world. Although this is just the beginning of community platforms, they already dominate such highly developed Internet markets as South Korea. These platforms call for new attitudes and behaviour on the part of their participants if they are to effectively use the Net to communicate with others. Currently, given the widespread availability of mobile broadband, people can connect to their communities anytime and anywhere. Sending photos over the Internet or mobile networks to friends is slowly replacing text-only messaging; it is more personal to send a photo or video clip since it is richer in personal content, similar to a person-to-person phone call - the future is 'personal' broadband.

Nevertheless, the new emphasis on personal communications requires new devices and networks. People always need to communicate, and not only while sitting at home in front of their computers. The rising demand for wireless broadband and advanced mobile devices reflect the need for increasingly personal, increasingly ever-present, communications.

Always on Internet devices

The new 45 nanometre chip technology permits the design of mobile devices with greatly reduced power consumption. These

devices will be as powerful as existing notebooks or desktop computers, but as small as PDAs (personal digital assistants) or mobile gaming consoles, making a new generation of mobile devices - MIDs or mobile Internet devices - possible. The main MID applications are web browsers, email clients, VoIP soft-clients and multimedia control software for video encoding and decoding. To simplify the development of future applications, open APIs - application programming interfaces - are available that give software developers access to the multimedia and connectivity features of the operating system. The devices offer always-on connectivity to high speed Internet, but they require the high bandwidth, low latency, networks that only WiMAX or WiFi networks provide. The key is definitely the operating system; as with PCs, the operating system defines usability and convenience. The power of the applications depends upon the operating system and the platform that drives the mobile devices - and the applications drive new markets.

The new devices will deliver a full, no compromise, Internet experience, smaller, but similar to that of a home PC connected to DSL or cable broadband. This means there are no limits to the Internet services and applications available. Nevertheless, the networks for mobile Internet have to provide the same performance as fixed networks, since Skype calls, YouTube video viewing and publishing all demand low latency and high bandwidth uplinks.

Many specific devices dedicated to Internet applications will come to the market in the near future, but all types of electronic consumer device - like gaming consoles, digital cameras and navigation systems - will be connected to the Internet. Car electronics and home security systems also demand, and will get, connectivity for maintenance, or usability and remote control. Connectivity must be cheap and efficient so highly integrated chipsets are required. WiMAX technology provides the required, standardised, ecosystem of chipset vendors, integrators and low patent license fees that can make Internet connectivity for all kind of electronic devices affordable.

Demand for new wireless networks

Devices that provide services based on Internet connectivity need that connectivity anytime and anywhere. Certain Internet applications are not as bandwidth hungry as others. Email, for example, has limited real-time requirements compared to VoIP

(voice over IP). Users accept delays sending and receiving email, but VoIP and video telephony are more demanding; delays are not acceptable. They need wireless broadband networks with real time connectivity and 80kbit/s to 200kbit/s of full-time bandwidth available for both downlink and uplink. Video streaming for non-real-time content requires high bandwidth, but not necessarily continuous connectivity as video content can be buffered on the device. Mobile devices generally offer several Gigabytes of storage that can be used for buffering.

Pushed by new mobile Internet devices and the 'connected life', the most demanding job will be providing the right networks. Fixed networks will always provide the highest speeds and richest applications like video broadcasting and streaming in highest resolution, but, similar to the mobile telephony revolution, wireless networks will give the highest growth rates and revenues as they serve the demand everywhere and offer personalized communications connecting every person and machine via wireless networks.

As all these applications ask for uncompromised connectivity; open access to existing mobile networks is not good enough since they were built for voice telephony. UMTS networks, even upgraded with HSPA, cannot satisfy the bandwidth and latency requirements of new applications and devices. They are limited by spectral efficiency as well as the network architecture, which works well for voice, but not for IP. New technologies like WiMAX give users a much better 'always-on' Internet experience, very similar to the WiFi networks used for home and office wireless networks, and WiMAX also allows cost efficient implementation in small mobile devices; WiMAX affords an end-to-end IP architecture for personal broadband.

Finally, new wireless networks will be capable of mobile broadcasting and multicasting to deliver real-time video and TV channels to end-users. Mobile devices will be both personal communications and entertainment devices. Demand for mobile and personal broadcasting will increase, and live TV, movies and music on demand will be delivered to mobile devices anywhere.

The future of wireless is mobile multimedia and personal broadband supported by new devices and new networks. ●

Mobile email in emerging markets

by Carsten Brinkschulte, CEO of Synchronica

The mobile phone, together with applications such as mobile email, will make great headway in emerging markets over the next few years, but the challenge for device manufacturers, service providers and software vendors is to understand the drivers that underpin this growth and amend their offerings accordingly. The rewards for everyone in the value chain are potentially huge, but there are challenges ahead too. The quiet revolution will continue, but who wins and who loses is still up for grabs.



Carsten Brinkschulte, the CEO of Synchronica, is a serial entrepreneur specialising in the mobile sector. Prior to founding Synchronica he founded a number of successful companies including Century Software and Weblicon Technologies in Germany. Before this, he worked as a consultant at SAP and Apple Computer. Mr Brinkschulte is a respected speaker, presenting regularly at conferences. He is also a panellist and presenter at the European Technology Roundtable Exhibition (ETRE).

Mr Brinkschulte began a degree course in Computer Science before leaving to start work in the IT industry.

There is a quiet revolution going on in emerging markets. At the heart of this revolution is the mobile phone, which is rapidly transforming people's lives in regions as far-flung as the Middle East, Asia, Africa and Latin America. Increasingly, the mobile phone is becoming the communications lifeline for business users and consumers in these regions, providing not only voice, but also SMS services and mobile email.

Almost 60 per cent of the world's first three billion mobile phone subscribers are from emerging markets, and most market researchers and analysts predict that the next billion will also come from these low-ARPU developing countries. According to a recent study by Portio Research, nine out of the top ten growth markets over the next four years

have one key defining factor in common - they are all low income per-capita markets. The only high-income per capita market to make the top ten is the USA. So what is driving this revolution, and how will the global market for mobile phones - and core applications such as mobile email - change over the next few years?

The challenges

Over the past 18 months, I have travelled extensively in Africa, the Middle East, Asia and, more recently, Latin America and have found that mobile operators in these regions are facing different challenges than those in the developed world. In many of these countries, fixed line and PC penetration is low, a high percentage - up to 70 per cent -

of the population live in rural areas, and those that have mobile phones tend to be on a pre-paid tariff and switch between operators frequently to get the best available price plan. They also tend to use lower-end handsets. In Bangladesh, for example, smartphone penetration is only about 0.5 per cent, close to 30 times lower than in the UK.

Furthermore, although the potential subscriber base in these regions is huge and still largely untapped, the relative value of each customer to anyone in the mobile phone value chain is small compared to the developed world. As a result, the focus is on capturing as much of the subscriber base as possible, to achieve economies of scale and optimal profitability from these markets.

Low fixed-line penetration

In India, as in many other developing countries, the number of email users outstrips the installed base of PCs, because relatively few people have the luxury of a broadband connection at home. In countries like India, the cost of establishing a fixed line network is prohibitive; this left the way open for more cost-effective wireless infrastructures to permeate all levels of society - from rich to poor, business to consumer - at an incredibly fast rate. Currently, most people have to travel to an Internet café to send and receive emails. In rural communities, one might walk a few miles each way just to send an email. This gives the mobile operator an enormous opportunity to provide convenient, low-cost mobile phone services including mobile email and other Internet-based applications on their existing handsets.

High churn rates

Another challenge in developing countries is to reduce churn among the largely pre-paid subscriber base, protect ARPU and contain customer acquisition costs. With the majority of subscribers opting for pre-paid tariffs, customer loyalty is minimal and mobile operators are struggling not only to keep existing customers from switching to the latest low-cost option, but to entice new subscribers to their service. The forward-looking operators are already looking at mobile email as a differentiator, as a way to reduce churn and increase ARPU. Mobile email is a valuable and convenient service they can offer to customers at a flat rate of around US\$3 a month - or even as a free service initially, funded from the customer acquisition budget.

Which handsets?

There is also the thorny issue of mobile handsets. The consensus is, that for mobile email and other content-rich data services to take off, customers first need to invest in the more expensive feature phones, or buy a smartphone. Most vendors in the value chain are trying to persuade customers to move up to a higher functionality phone in order to benefit from these new services. The reality is that this is just not going to happen in emerging markets: these higher functionality phones, while great for the developed world, are too expensive to suit the pocket of a Sudanese or Bangladeshi consumer. They need applications and services that can work on even the most basic of phones. For device manufacturers and mobile operators, this means ensuring that they are able to offer

customers in these markets the ability to sign up for these new premium services, without having to invest in one of the more expensive handsets.

Mobile email standards

For new applications such as mobile email to succeed at a mass-market level in emerging markets, the issue of standards needs to be addressed. Most existing mobile email solutions are based on proprietary protocols,

requiring users to download additional client software. This approach is set to fail in the developing world, where the overwhelming majority of people have feature phones that cannot use proprietary clients. Time and again, it has been proven that consumers won't adopt services that are hard to set up or difficult to use. They want to be able to use mobile email services on standard mobile phones, right out of the box - no software installation, no fiddly configuration, no expensive proprietary devices.



The only viable option is for service providers to use open standards to interface with the built-in email applications that are shipping pre-installed with the vast majority of devices today, enabling both smartphone and mass-market feature phones to receive push email, or convert email to text so that the message can be received on every single phone in use today. Once they have that part sorted, operators need to ensure a seamless set-up, by adding automatic client provisioning of the built-in email application.

The next four years

Given all of the above challenges, how will this market play out over the next four years or so? Informa predicts that there will be 4.81 billion mobile phone subscribers by 2012, with the next billion subscribers coming from emerging markets. Which handsets will these subscribers be using, which service providers will be successful and which applications/services will prove to be the mobile phone's 'killer app'?

My belief is that handsets sold into emerging markets will continue to be mainly lower-end devices. Consumers will adopt very few smartphones in these markets. Mobile software vendors and service providers need to acknowledge this fact and offer applications and services designed to work on even the most basic handsets, if they are to succeed in these regions. As an example, service providers must offer mobile email services with a push email solution that works on the majority of standard mobile phones already out there in the market. This means using a mobile email solution that does not require an email client to be installed on the handset and that can be set up and configured quickly and easily from the user's phone, rather than needing a PC to do it.

Mobile operators need to provide relevant additional services to their customers and get their pricing plans right, in order to reduce churn while also increasing ARPU and customer loyalty. I believe email will be the 'killer app' for the mobile phone in emerging markets. Email is one of the oldest Internet applications; it serves a real need and will continue to do so on the mobile platform. It complements SMS service and is a cost-effective and convenient way of allowing people in disparate locations to stay in touch. By offering a mobile email service to subscribers at perhaps US\$3 or US\$4 dollars a month - or even free of charge for a limited period - mobile operators can steal a march over their competitors, reduce churn and, in time, increase ARPU.

Another service that I believe will prove successful in emerging markets, as well as in the developed world, is a backup and restore service - an insurance policy against the loss of data stored on a mobile phone. As people in emerging markets start to rely almost exclusively on their mobile phone as an information repository for their entire business and social network, a lost or stolen phone becomes a huge problem. A lost or stolen phone is also bad news for the mobile operator: studies show that it can take up to three months for a subscriber to restore his data, during which time ARPU will plummet. Service providers offering a low-cost facility for backing-up and restoring this lost contact information over-the-air will be providing customers with a valuable service that will improve customer loyalty while also raising ARPU. ●



WiFi roaming

by Igor Zabolotniy, Acting General Director, MTT - Multiregional Transit Telecom, Russia

WiFi hotspots are essential for travellers and for those who work in the field; they look for them as avidly as travellers in a desert seek an oasis. According to Gartner there are 50 thousand public hotspots serving 60 million people and generating US\$9 billion in revenue. WiFi roaming is complex. WiFi aggregators in many countries, including Russia, eliminate the need for operators to sign separate roaming agreements with operators the world over to provide roaming connectivity for their subscribers.



Igor Zabolotniy is the Acting General Director of MTT (Multiregional Transit Telecom), where he served previously as Deputy General Director for Commerce. Prior to MTT, Mr Zabolotniy served in a number of executive positions including as Deputy General Director for Marketing at the Russian Satellite Communications Company (Federal State Unitary Enterprise) and as General Director of OJSC Dalsvyaz. He also worked as Acting Director and Head of the Marketing and Sales Department at JSC Svyazinvest, and as Acting Director - Head of General Service Operation Department at JSC Rostelecom.

Mr Zabolotniy graduated from both the Moscow Technical University of Communications and Informatics, and the Federal Institute of Industrial Property. He earned an MBA degree from The Academy of National Economy under the Government of the Russian Federation.

Hotspot users, being extra-mobile people, face a crucial problem roaming with WiFi. Demand for WiFi service is high and growing. According to Insight Research Corporation, the number of WiFi business users will increase year by year. It is no wonder, then, that most hotels, cafés and restaurants in the USA, Europe and Asia are equipped with WiFi hotspots. Specialized Internet cafés, as with most services, tend to close at 8 to 9pm, so for travellers, WiFi is the only way to access the Internet after 9pm. Travelling executives find it much easier to use WiFi connection in a hotel room, than to search for an Internet café in an unfamiliar city after a busy day. It is a perfect opportunity for Internet providers and mobile operators to increase their customers' loyalty.

The WiFi hotspots market is rapidly growing. According to Gartner Dataquest, by the end of 2008 there will be over 150 thousand hotspots worldwide, serving some 60 million users and earning about US\$9 billion.

The Asia and Pacific region is growing most rapidly, but the most intensive WiFi penetration - 72 per cent - is in North America and Europe with 70 thousand hotspots in use by the end of last year. The overwhelming majority of networks have roaming agreements with other networks and hotspot aggregators. WiFi hotspot services are increasingly popular in our country; J'son & Partners analysts expect there will be over 13 thousand hotspots operating in Russia by the end of the current year - about 9.4 thousand more hotspots than last year.

Currently, most of the demand in the Russian WiFi market is to provide roaming for subscribers to third party national and foreign operators' WiFi networks. This has stimulated Russian WiFi operators' interest in providing WiFi to their subscribers. We expect that five to six per cent of subscribers to the services provided by Russian WiFi operators will also roam.

Hotspot aggregators are playing the main role in the development of this market by negotiating multilateral roaming contracts with a variety operators. Because of these multilateral contracts, an operator's subscribers can access not only his own carrier's hotspots, but also those of all the other carriers who have made similar contracts with the same aggregator. Without aggregators, hotspot operators would have to negotiate separate bilateral roaming agreements with every individual hotspot operator. There is currently only one WiFi hotspot aggregator providing national and international roaming in Russia.

The number of hotspots in the RF (Russian Federation) doubles every two years, but are they profitable for their owners? Up to one-third of WiFi hotspot services are free of charge to users; they serve simply to attract tourist customers to cafés and restaurants.

No doubt, the driving force behind the popularization of WiFi networks comes from the user's need to stay in touch long cultivated by cellular network operators. As the availability of WiFi grows, and laptop computers, pocket PC and smart phones, all with built in WiFi as a standard option, become more available, WiFi will grow apace.

However not every resident user is willing to download information at the price of tens of cents per megabyte, as it is easier and less expensive to do the same from home or office. Public WiFi networks aim mostly at travelling professionals - mobile employees working away from their home city or office - and tourists. These users away from their home networks must connect to the network of a WiFi roaming operator.

The procedure to connect to a WiFi network of most providers is essentially the same. The user needs a WiFi enabled device - a computer, pocket PC or smart phone with an embedded WiFi adapter, and a prepaid card. One must register on the provider's website and get a personal account. There are a number of ways to pay - including MoneyWeb, mobile phone credits or credit cards among others.

What is WiFi roaming?

WiFi roaming, both national and international, makes it possible for subscribers to use the WiFi network of an operator in a region they are visiting, by entering a login and password assigned by their home WiFi operator. Moreover, all of the subscriber's payments for traffic while visiting other networks - the roaming service itself - are settled with their home operator. This makes it easier to use WiFi hotspots while travelling, as there is no need to buy scratch-cards from different carriers or find other ways to connect to their networks. No doubt, WiFi is very profitable for carriers as well, as it creates opportunities to gain extra income and increase subscribers' loyalty.

The Russian WiFi aggregator, connects their facilities to its own WiFi roaming node, and when a visitor registers in a local hotspot, provides AAA traffic transmission (Authentication, Authorization and Accounting) between itself and the visitor's home network, collects tariff data for settlement among WiFi operators, and transfers quotas of subscribers to its roaming partner operators. In the case of international roaming, AAA traffic is also transferred through a WiFi roaming node. WiFi network

aggregators carry out all settlements between visiting and home operators, and provide inter-carrier exchange of authentication traffic, collection of all the necessary carrier class tariff information for settlements, and coordinates all interactions between service providers.

For international roaming, several large foreign aggregators require exact hotspot identification and the support of an intelligent customer 'connection assistant' for incoming roaming to Russian networks.

Russian aggregators must provide an interface to the equipment used by Russian operators - which does not fully correspond to international requirements - in order to interact appropriately with the equipment used by foreign operators and aggregators.

WiFi roaming for business

The number of people who are obliged to stay constantly online for business reasons is increasing every day. How can WiFi roaming help them?

- Mobility - the opportunity to receive wireless access wherever there is a friendly WiFi network;
- Simplicity and convenience of payment - there is no need to bear the extra expense of purchasing services locally in addition to that already paid to the 'home provider' for access. This is typical for those who pay for Internet services from corporate funds;
- Safe and secure payment for services - in many countries the services of local WiFi operators are paid by credit cards via the Internet; WiFi roaming obviates the need to provide credit card details to an unknown ISP; and
- An opportunity to get services at best prices.

Prospects for WiFi

International WiFi roaming service recently became available in Russia, when a contract was signed with Comfone, a huge Swiss hotspot aggregator that uses the WeRoam trademark. The WeRoam network includes over 35 thousand hotspots from 54 WiFi operators in 62 countries of Europe, America, Asia, Australia and Africa. The first stage, after testing, offers one-way roaming that lets Russian WiFi subscribers connect to WeRoam's hotspots. In the near future, two-way roaming will give WeRoam subscribers

travelling in Russia and CIS countries access to local hotspots.

In the near future, WiFi roaming will be available in all regions of Russia and the CIS countries.

Later, a new business model will be implemented to allow Russian cellular company subscribers to use SMS, to get a login and password for Internet access through a domestic or foreign WiFi hotspot.



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