

Broadband, a platform for innovation and development

by Franco Serio, Italtel CTO

Next generation broadband networks, often promoted by governments, will severely stretch the resources of network operators, vendors and global systems integrators alike. Rapid product and technological evolution, rising market expectations, fierce competition and rapidly dropping prices all complicate the operator's planning. The profound transformations and complexity of the new generation networks will test the knowledge and skills of vendors and global solution integrators alike; both will need to acquire new skills through alliances and partnerships to structure the essential multi-vendor solutions.



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Many European countries such as France, Germany, United Kingdom and, more recently, Italy are working at projects to boost the digital economy through the deployment of ultra-broadband networks, based on fibre to the home (FTTH), and traditional broadband networks to eliminate the digital divide between urban and rural areas. These new networks are essential to support the development of innovative content, services and projects for eGovernment.

In Italy, several next generation network projects have been announced recently. Telecom Italia (the incumbent) and a joint company made by Vodafone, Wind and Fastweb, are competing to cover, with fibre, the most important Italian cities. At the regional level, the public administrations of the most industrialized regions in Italy - Lombardy and Trentino for example - aim to

provide broadband access for everybody and ultra broadband in the main regional cities for about 50 per cent of the population.

While each country maintains its own network development policy, the EU Commission works to establish new rules for broadband communication with regard both to technological aspects (unbundling and migration from copper to fibre networks) and general aspects (accessibility, quality, neutrality and transparency).

As the Internet is transforming every aspect of life, these choices will have a major impact on people knowledge, competitiveness and evolution of the actual concept of country's democracy.

The Digital Agenda drawn up by the European Commission outlines a structured

action plan to create a virtuous circle in which ICT, Internet and broadband networks boost economic growth, innovation and business development.

One of the seven priority areas for action outlined by the Digital Agenda is guaranteeing the provisioning of much faster Internet access. The 2020 target is to bring Internet speed to at least 30Mbits for all and to have half of the European households with 100Mbit connections. At present, only one per cent of Europeans have access to fibre-based high-speed networks as compared to 12 per cent of Japanese and 15 per cent of South Koreans.

A big step forward

Independently from technical solutions, development policies, operators' business

models and large long-term investments, next generation broadband and ultra-broadband network deployment represents a turning point of fundamental importance for the ICT sector because it:

- rewrites the interconnection rules among fixed, mobile and Internet operators to allow everybody to be always connected within any network and with any device;
- moves from the logic of overlay networks to a single IP-based network; and
- leads to a complete transformation of roles and values for all the actors involved in the value chain: telecoms, OTT (*over the top* - direct access to content and services over the Internet) and Web companies, technology vendors, application developers and smartphone manufacturers.

Telecom operators, OTT and new services

Until a few years ago, telecom operators dominated the relationship with end customers. The operators invented and introduced new services; the time to market to deliver new applications was not so important then. Today, the dominant role has been taken over by OTT companies (Google, Yahoo, Apple etc). Thanks to the greater availability of free bandwidth, each of them has adopted own distinctive and winning strategy for attacking the market with new services based on a Web 2.0 approach. The possibility to 'mash up' different applications and the technology to produce smartphones at a reasonable price, allow the introduction of hundred of thousands applications with an incredibly short time to market.

Telecom operators are still discussing how and where to gain profit in this new scenario since it is not currently possible to charge data services and the new applications in different ways. Just trying to increase capacity and improve the quality of the networks without having a different business model is not a good choice. Moving away from a flat rate ('all you can eat' model) operators must start to sell bandwidth based on demand, identity management and different levels of quality of service (*QoS*). Network congestion and bandwidth shortage are not due to traditional applications such as email or browsing but to the massive use of Web 2.0 applications and social networks with a high multimedia content (video and photo sharing - video communications - on the web...). A large-scale analysis conducted by Cisco in 2009 estimates that in 2013 the annual global IP network traffic will reach 667 exabytes (quintillions of bytes), growing at a CAGR (*compound annual growth rate*) of 40 per cent from its 2008 value of 122 exabytes, a growth only

marginally influenced by the economic crisis. Business traffic on fixed networks will only account for 23 per cent of the entire global IP traffic in 2013 while the fixed consumer component (P2P, IP CAT/TV, Internet video) will represent 73 per cent of it. Mobile IP traffic (business and consumer), favoured by the rapid spread of smartphones and the downloading of mobile Internet applications from application stores, will have a small share, just 4 per cent, but a CAGR of 131 per cent with respect to 2008.

Neutrality, revenues and QoS

The net neutrality issue raises many issues. Should service providers be allowed to give priority to one application over others or to raise charges for a higher quality service? Who should supervise the transparency of the traffic management systems? Who should make sure that there is no contents discrimination? Would an open network really solve congestion problems and eliminate bottlenecks?

For their part, users want well-defined and transparent rules that prevent network operators from profiting by favouring their own contents or that of partners and that keep governments from discriminating between users according to their political ideas, sexual tendencies or religious beliefs.

Application-aware routing and QoS should be provided by a sophisticated policy control resource function fully compliant with net neutrality. This will be essential in the future to avoid a collapse of the network and to guarantee that the telecom operator receives a reasonable margin. Each user will decide, application by application, how each will run in the IP Network - best effort (as today) or using dedicated bandwidth.

How to finance development

In 2009, the speed of wireless networks grew reaching 28.8Mbits per second, while the speed of fixed networks reached 20Mbits per second, data traffic increased by 93 per cent and smartphone sales grew by 39 per cent. It is easy to imagine that the launch of the iPad and a series of competing products will boost network traffic, particularly mobile networks, and generate demand for large investments to eliminate bottlenecks in both the access and the core layers of the networks. For a country like Italy, the investments required to create an NGN (next generation network) would be between 10 and 15 billion Euros.

In the debate over the financing of ultra-broadband NGNs, the positions of the parties are a long way apart. Telecom operators

would like to share the profits (for example on-line advertising) with content suppliers - who make widespread use of networks for their new bandwidth demanding services - to improve the return on investments.

The Web companies, naturally, feel that what they are paying the operators for the use of bandwidth is enough.

To maintain their role in the services arena, telecom operators must offer something that cannot be offered by OTT providers. The rich communication suite is an example; mobile operators are trying to provide Web 2.0 multimedia communication with interoperability among different mobile networks over smartphones and PCs, to speed up the introduction of new services. The problem is the time to market; the project launched in 2007 is not yet commercially available!

For an ultra-broadband network it is necessary to have long-term investment and will also be necessary to introduce some flexibility (from Local & European Telecom Authority) for the companies that decide to build a new infrastructure.

Vendors and global solution integrators

The scenario has also changed for technology vendors. The main players with very broad products ranges are pushing rapid product and technological evolution to meet market requirements and to deal with the fierce competition that continuously brings prices down. Niche vendors - both new and well-established - take advantage of their high degree of specialization and specific competences to gain market shares in valuable areas such as mobile data, optical access systems, security, quality of service, video-based applications.

Global solution integrators capable of combining different technologies and products to build future all IP networks - starting from existing networks and providing appropriate levels of interoperability - will play an increasingly important role.

The profound transformations and complexity of the new generation networks will test the knowledge and skills of vendors and global solution integrators alike; both will need to acquire new skills through alliances and partnerships to structure the multi-vendor solutions the market requires. ●