

NGN development at Magyar Telekom: The future of our fixed network

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Fixed-line telecommunication is at crossroads. Mobile is dominating the voice market and is developing toward offering multimedia. Internet penetration is growing and applications on Internet are blossoming. Broadband access is spreading and the developing bandwidth capability more and more appeals for attractive content. Usage of legacy telephone service is declining. Next Generation Network (NGN) – having the Release 1 standard package published – gives new opportunities to renew fixed telecommunications offering feature-rich multimedia services and applications. Magyar Telekom is running an ambitious development to deploy broadband access and to build up an IMS based NGN network that will be also the technical basis of the ongoing integration of Magyar Telekom and T-Mobile Hungary.

1. Introduction

Magyar Telekom as the main incumbent telecom provider of Hungary provides a wide range of services. Magyar Telekom Group comprises lines of businesses and a family of subsidiaries. It holds a majority stake in MakTel of Macedonia and Telekom Montenegro and it is also present in Ukraine, Romania and Bulgaria. Magyar Telekom is the market leader in fixed telephony (78% by 2 753 thousand phone lines and ISDN channels), in mobile services (45% by 4 194 thousand subscribers), in broadband access (79,8% by 329,3 thousand DSL lines) and in Internet services (36,2% by 328,5 thousand subscribers)*.

Competition opened four years ago is extending as service demands, technical capabilities and business models are developing. Mobile is dominating the voice market. It is more characteristic in CEE countries, where mobile has overcome fixed telephony at a low/moderate penetration of the latter. Mobile has advantages based on intelligent terminals and services that make it attractive beyond the convenience of mobility.

Internet penetration is growing and applications are developing. Voice over Internet offers mean a threat to legacy voice services that is increasing with the deployment of broadband access. As broadband access becomes independent from PSTN subscription the substitution effect of VoIP will be significant. Demands for bandwidth, for broadband access is growing and the increasing bit-stream capability more and more appeals for video services. That leads to the objectives of triple-play: the combination of voice, data and video (entertainment) services.

User terminals are rapidly developing: growing intelligence, IP/Ethernet/SIP interfaces, portability and other convenient capabilities. With emerging broadband wire-

less technologies new possibilities are opening for upgrading fixed network offering certain kind of mobility, and for fixed-mobile convergence.

Telecom players operating on one or two markets are preparing to move and enter lines of telecommunications, e.g. PSTN resellers and alternative providers are expectedly going to enter the mobile market as virtual network operator (MVNO), CATV providers are offering also Internet and VoIP.

The main technology stream that utilizes the trends of broadband access deployment, the feature rich applications and flexibility of Internet (IP), the mobility, the portable intelligent devices, multiple access solutions including wireless ones, and aims a convergent telecommunication integrating voice, data, video (entertainment) is the development of Next Generation Network (NGN).

Magyar Telekom's strategy is to build NGN in harmony with broadband deployment as the technical enabler of becoming a next generation integrated telecom provider.

2. Broadband evolution

For NGN – as being an IP-based packet switching network – broadband access is a prerequisite. Having the objective of providing a wide scale of multimedia services from voice to high quality real-time video broadband access expansion is one of the most important strategic assets.

Broadband deployment was started for offering fast Internet access. From now it will be gradually re-positioned into multi-service access, the access of NGN. TV based entertainment services are the next step towards serving the communication and entertainment

* Figures refer to the end of 2005

needs of a family. In short term IPTV implementation is starting with current access technology (4-7 Mbps) to get ready for the future and to compete with 3play offers on cable. In long term start segmented access network developments to enhance service delivery capabilities for the next generation connected home (HD IPTV, video telephony, multiple PCs, high bandwidth internet, interactive gaming).

Development objectives can be seen in Fig. 1. The targeted total number of broadband customers at the end of 2008 is 1 000 000 including residential and corporate users. Beside Internet usage VoIP, IPTV and broadband gaming will take off; in year 2008 dual and triple players will represent 15% and 22% of total access.

NGN will interoperate with every type of access technologies. The main short term goal is to offer a wide spectrum of fixed and wireless connection possibilities, which allows MT to provide broadband interfaces for different local situations. The mass market broadband demand will be served on the basis of ADSL and ADSL2+. Our goal is to increase ADSL penetration from 15% up to 45% on copper lines. WIMAX will be used as a Hot Zone infrastructure for high speed data communication, to cover DSL gaps, replacing Fix-GSM and for LTO expansion.

ADSL coverage will reach 90% of subscribers and 51% of settlements for 2008.

The long term strategy is moving forward to an optical infrastructure and replacing step by step the traditional copper network elements to enable broadband access up to 25 Mbps. In 2006 MT is testing the strength of a passive optical network (PON) and VDSL2 in pilot implementations for green field areas.

3. Evolution of NGN

The long term, perspective solution to the challenges of telecom is the converged common network: Next Generation Network. The main objectives of NGN may be summarised as: multi-service integrated network, technology-independent services/applications, and ubiqui-

tous and personalised services. Building a common network for all services promises benefits of reduced investment and maintenance costs. Technology independence of services needs special next generation service concepts, like OSA/Parlay, and promises flexibility and the separation of operator and service provider roles. Ubiquity and personalisation of services means that users may compile service features for their demands, and the same set of services may be accessed via different access means and from different locations: the concept of mobility is extended, nomadic usage appear even at the edge of fixed networks.

NGN means a significant change in architecture: instead of monolithic exchanges, there are separated functional entities, and control functions earlier being hidden inside a switch, appear between devices – it promises flexibility and economy, but on the other hand this is challenging for standardisation.

Standardisation has been in progress very intensively and resulted in the Release 1 package of ETSI/TISPAN. The important fact is that standardisation shows convergence: IP Multimedia Subsystem (IMS) – being specified by 3GPP for 3G mobile has been accepted as the basis of the common architecture.

After an early period while NGN was considered as a new way of telephony promising cost reduction, we arrived to a milestone when the concept of a real multi-service integrated network is specified. The overall architecture highlighting the main characteristics can be seen on Fig. 2. (on next page).

Motivations for establishing and deploying NGN are: cost reduction, defending against competitors attacks (competitiveness), business opportunities via new services and the ending of old technology lifespan. Cost reduction could be realized only by replacing significant segments or the whole of old platform that can not be justified in short/medium terms at stagnating demands. PSTN/ISDN platform shall be sustained, that is assured by life cycle management agreements. The technical basis of defending our positions and to find new business opportunities is establishing an overlay NGN platform.

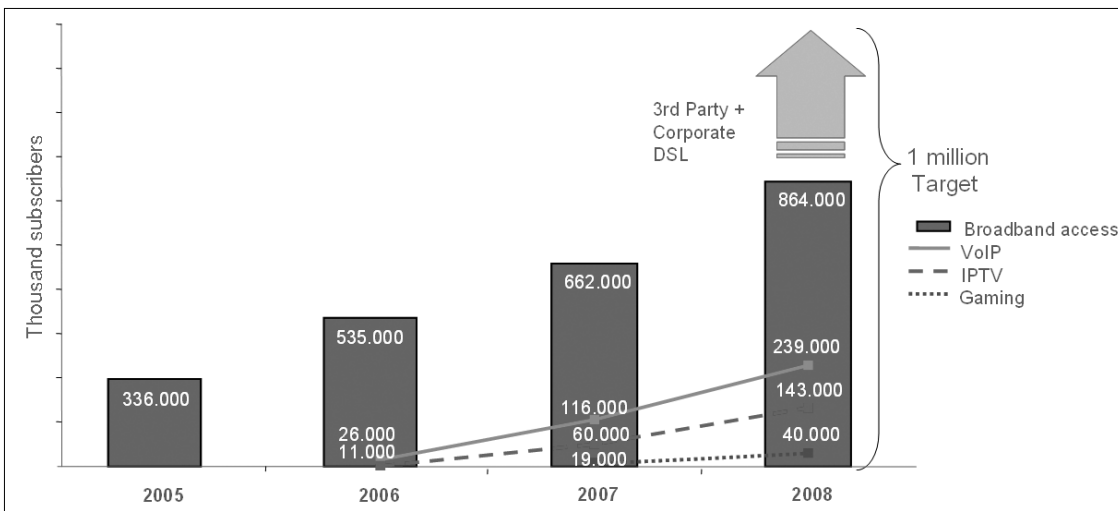


Figure 1. Broadband access development objectives

MT implemented a pre-NGN platform based on soft-switches to get technical experience with an NGN platform and its interconnection to PSTN, and to give economic and perspective solution for actual VoIP demands: Voice over CATV, Voice over Internet, Unified Governmental Backbone, Romanian Presence. Having the standards of the IMS based NGN, the multimedia service objectives and the merge of MT and T-Mobile Hungary the overlay NGN platform is being built according to TISPAN NGN specifications.

The scope of our NGN project is:

- Exploiting potential synergies of integrated development, operation and maintenance of MT's telecommunication networks
- Common selection and implementation of a carrier grade NGN platform for MT Group
- Integration of pre NGN platform
- Common implementation of (new) services for existing market demands

Roles of overlay NGN platform:

- Data and video services accomplishing 3play service offers from one platform
- Carrier hosted business communication, integrated voice-data services to business market
- Migration of VoIP services on pre-NGN shall be judged case-by-case
- It will be the basis of platform consolidation: substituting legacy voice and data platform.

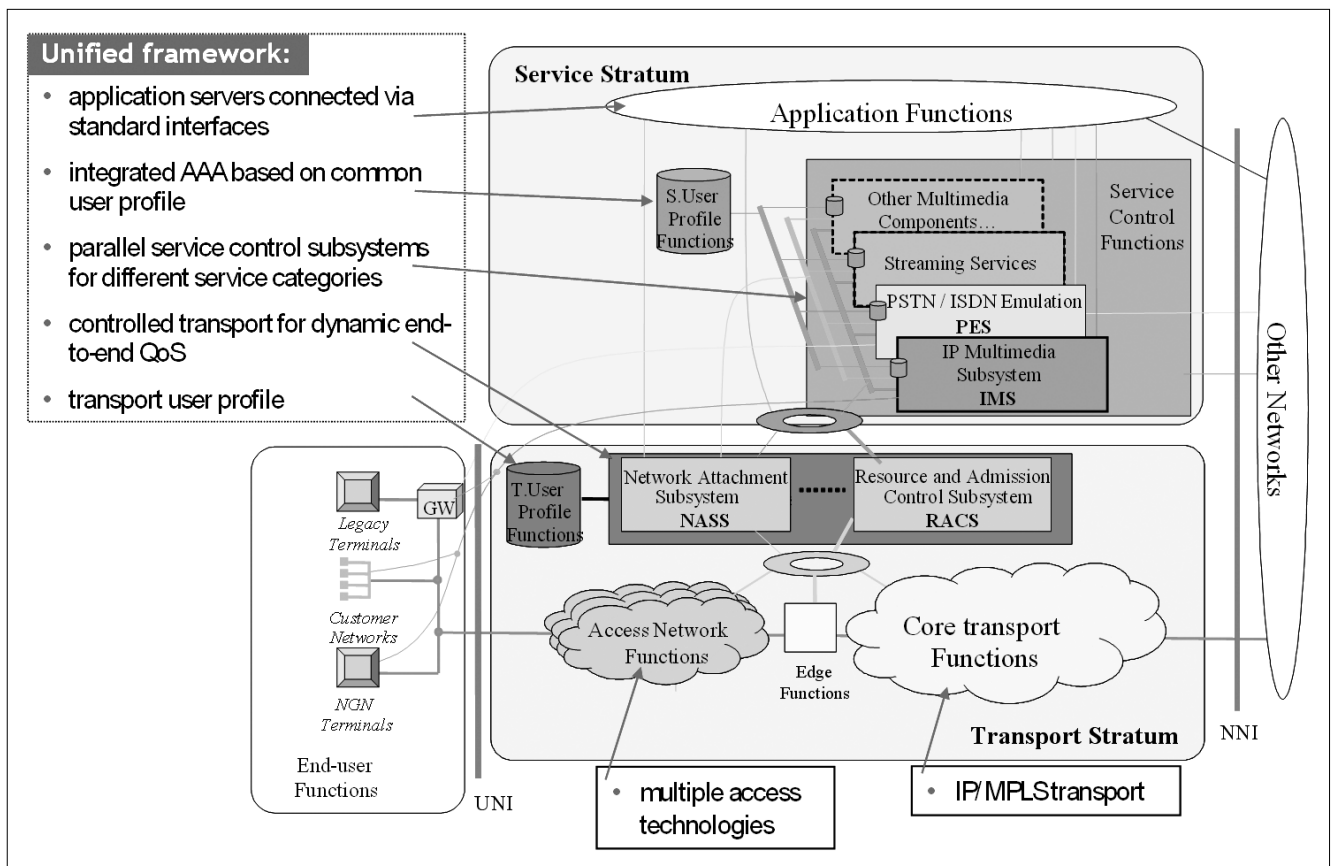
4. Network consolidation

The main objective of the convergent NGN to operate an integrated multi-service network instead of several networks of different technologies for different services will be reached if the legacy networks are substituted by it.

Although the substitution of PSTN/ISDN network in short term is not justified, offering VoIP services on the overlay NGN platform will stimulate subscribers to leave PSTN and use the new services. This service-driven migration will decrease the utilized capacity of the old platform. A gradual technical migration shall be started substituting exchanges of low utilisation. In the next five years more than half of voice lines will be provided by NGN (see Fig. 3). For the objective of stopping decline of total voice lines a significant part of VoIP shall be offered in new area and as second line.

Consolidation of networks and network elements is generally planned. The actual steps are depending on the technology, the services produced and the status of the given network. The motivation is to decrease operational costs by ceasing technologies, platforms selecting those for further operation that matches to NGN architecture and requirements. In case of some technologies like PDH transmission it means the substitution by SDH or IP. In case of the legacy IN platform it may be replaced by SIP server that matches into the NGN architecture and is capable to control also the PSTN for providing IN services.

Figure 2. Overall NGN architecture



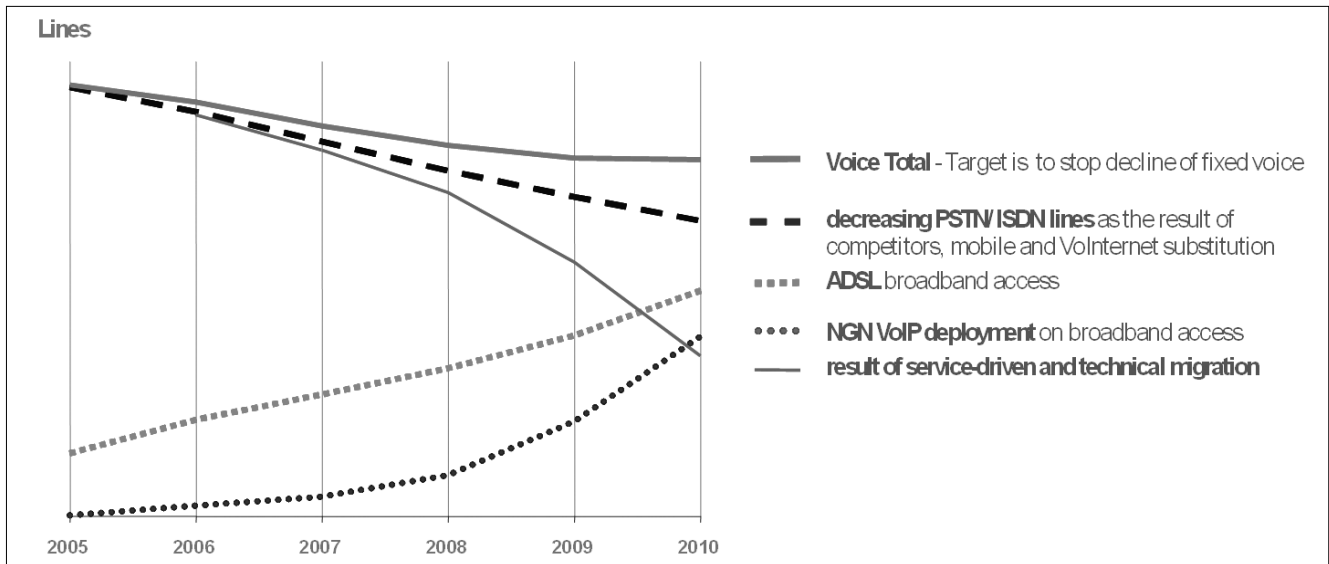


Figure 3. Consolidation impacted by VoIP deployment on NGN platform

5. TMH integration

As a relevant part of merging T-Mobile Hungary (TMH) to Magyar Telekom an Integrated Network project is in progress. It focuses on synergies of integrated development, operation and maintenance of MT's telecommunication networks. It elaborates cost efficient integrated network concept based on market requirements as defined by residential and corporate segments, and analyzes the development opportunities of the current network infrastructure towards NGN (see Fig. 4).

T-Com transport network provides transport service for all demands of MT group, including backbone for T-Mobile's UMTS. The core transport technology of NGN is IP and will be developed into a high-availability multi-service transport.

Fixed and mobile environment gives different requirements for IMS, that justifies implementing two parallel subsystems. The key is the compatibility that is important for interoperability with the application servers and between different service control subsystems.

On the top of the parallel service control subsystems (IMS-es) common application servers will provide fixed-mobile converged services:

- provide flexible product development (faster to the market and simplified for the network operation);
- enable inter-working of IP services across networks (e.g. roaming) or across services (service inter-working);
- e.g.: TV, video sharing, multiplayer gaming.

6. Conclusions

Establishing IMS based overlay NGN is the main stream of Magyar Telekom's infrastructure development. NGN capabilities will give answers to challenges, providing fixed-mobile convergent and feature-rich communications, services with guaranteed quality and security, attractive content for broadband and a variety of applications on new CPEs.

NGN is the target where existing technologies shall converge – consolidation of legacy platforms will be made gradually: PCM, PDH, ATM, MLLN, PSTN.

Figure 4. NGN infrastructure for fixed and mobile services

