

Contemplating the Next Move

Operators around the globe are taking on major modernization programs that will mean a fundamental change to their networks and systems architectures. Before spending vast amounts on new technology, operators need to ask themselves some pretty fundamental questions about why they are embarking on these ventures. Despite all the razzmatazz around the demand for supposedly eye-catching new services built on convergence, the reality is that the rationale for these programs is large-scale cost extraction and the drive to be the lowest-cost provider.

by Patrick Glasheen and Graeme Clark

Anybody in the technology, media, and communications sectors who hasn't heard the term *convergence* day in and day out for the last year or so must have been living on the moon. It's the buzz of the moment, and nearly every week we hear about new convergence plays by providers wishing to extend their reach to begin the pillage of new markets.

But, what is convergence? If we assume it's about integrating computers, telephones, broadcast technologies, and content within all-digital environments, then the value generated from convergence comes from making innovative use of data from various technologies for faster, more flexible distribution.

The race to bundle

Convergence in the communications sector can be considered in terms of network, services, and application layers. These layers typically map onto the three planes that make up next generation network architecture: the transmission, control, and service planes.

Network. Transforming disparate, service-specific network platforms into a common and cost-effective IP-based platform. Running one uniform network enhances economies of scale and operational efficiency and puts even greater importance on traffic volume in the quest to be the lowest-cost producer.

Services. Delivering voice, video, data, messaging, and mobility services across a wide range of terminal devices via a multi-service platform over various networking media—mobile, wireless, cable, DSL, and Ethernet.

Application. Providing innovative services based on network-based applications and application-laden customer devices. Applications service providers can use network “hooks” to facilitate service provision and retail competition in areas such as interactive gaming, network-based personal video recorders, and other Web-based services.

In reality, operators are not currently offering converged services in the true sense. True convergence would lead to

the integration of various technology platforms and support systems. Operators are bundling services together with some integration and calling it convergence. The “bundled” proposition, to date, has been more prevalent than have unique content and services.

Take, for example, the recent moves in the United Kingdom by Carphone Warehouse and Sky. These operators are entering markets to tap into new customers where regulatory and technical precedents are already well established. They are not providing new services based on groundbreaking technology innovation in which the services are provided over a converged platform.

We can see why operators are backing bundling, but are customers really crying out for it? There is a built-in assumption among many operators that customers inevitably will be attracted to the fundamentals of bundled packages, including:

- Simplicity and one-stop shopping.
- Discounts from bundling services (or, indeed, bundling services for free).
- Single bills.

“Build it and they will come” is something we've heard before in this industry (remember the 3G auctions?). This would be a mistaken mind-set. Bundling of services is not always in the interest of consumers and they know it. Far from enhancing customer loyalty and extending share of wallet, there is a risk that customer relationships may be undermined, and the brand damaged, if new services are perceived to be inferior to existing ones or those offered by competitors.

If not presented effectively, a single bill can destroy value from bundling, partially through “sticker shock.” Also, it is a constant reminder to customers that they should be looking for rolling discounts, free services, etc., as a reward for what they spend.

Indeed, the faltering experience of many new entrant, specialist triple-play providers (e.g., Video Networks, Bulldog) suggests that bundling per se is not highest among customers' purchasing criteria ... unless it is offered for free.

The rocky road to convergence

Many operators today view these apparent contradictions as nothing more than early frictions in the long-term move toward convergence as a central driver of customer behavior; and most have long-term plans in place that feature network convergence at their core. In effect, network convergence is simply viewed as the next, natural, and inevitable phase of network evolution.

Most major operators' plans involve nothing short of the complete transformation of their networks and IT infrastructures. Apart from cost reduction, they believe that this transformation has the potential to create value through the innovative use of data generated from a variety of fixed, mobile, and broadcast channels.

So, what plans are in place as operators rush ahead with new technology investment to provide true convergence? At the heart of fixed and mobile convergence plans, we find the concept of the next generation network (NGN). NGN is the real enabler of convergence at the network, services, and application levels.

What is NGN?

A quarter of a century ago, incumbent operators typically ran one network, the public switched telephone network (PSTN). The PSTN was designed to carry voice only. As demand for data communications developed, the incumbents were forced to adapt. Rather than replace the PSTN, they built new networks that ran in parallel—and the overlay network was born.

As network technology continued to evolve, so the number of networks multiplied to a point where today most incumbents run a very broad range of platforms, each with its own distinct characteristics and billing and support systems. The problem with this approach is that it has created a spider's web of complexity, resulting in huge operational inefficiencies, reducing economies of scale, and duplicating capital expenditures (capex).

NGN is about simplifying and delayering networks. The goal is to enrich the service portfolio, lower capex demands, and deliver efficiency improvements. This goal

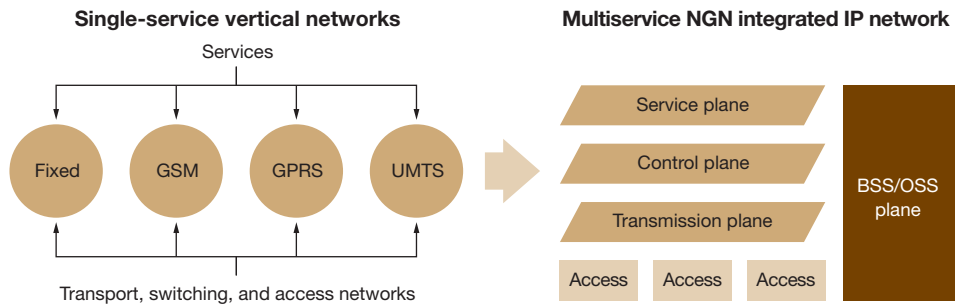
leads to a radically different view of how networks are structured. As BT puts it, the difference is like moving from a “bowl of spaghetti” to a “meager lasagne” — simplifying the network and streamlining the organizational structure. Operators are fed up with the inefficiencies of the single-service vertical network approach and see the deployment of multiservice integrated networks based on IP as a way to offer a variety of products to their customers over a variety of access mechanisms and customer premises equipment (see Figure 1).

The ITU Telecommunication Standardization Sector (ITU-T), which coordinates standards for telecommunications on behalf of the International Telecommunication Union (ITU), has specified a working definition of NGN. It defines NGN as a packet-based network able to provide services, including telecommunication services; able to make use of multiple broadband, quality-of-service-enabled transport technologies; and in which service-related functions are independent from underlying transport-related technologies. NGN offers users unrestricted access to various service providers and supports generalized mobility, which allows consistent and ubiquitous provision of services to users.

One problem with ITU-T’s definition is that it leaves various interpretations open as to exactly what NGN is, as it is framed in a set of generic principles, and this can introduce commercial uncertainty of where NGN begins and ends. Often we find that the commercial function within an operator expects a solution that is a panacea for all an operator’s problems, i.e., overnight NGN delivers a lower-cost network with a rich set of functionality that can be flexed quickly to provide a broad range of services. This, clearly, is not the case, and operators need to agree from the outset on consistent corporate-wide definitions of what NGN is, what services they wish it to provide, and over what time frames.

The key differences between a traditional incumbent’s network and an NGN boil down to some fundamental characteristics (see Figure 2).

Figure 1: Vertical vs. integrated IP networks



A goal of next generation networks is simplification—replacing the complexity and inefficiency of single-service networks with multiservice networks and their varied means of access to customers.

At face value, therefore, NGN sounds like great news for operators—innovation drives improvements in the revenue yield per unit of traffic while technology drives down the fixed cost (both capex and opex, or operational expenditures) of the network.

Where from here?

Some incumbent operators are already undertaking NGN activities. BT aims to move the majority of its subscriber base to “broadband dial tone” by 2009 and is looking for annualized cost savings of GBP1 billion per annum (pa) from its “21st century network.” The company believes that capex in the medium term is likely to be sustained

below current levels of GBP3 billion pa once network migration is completed. Broadband dial tone will provide services at the click of a button, enabling customers to come online virtually instantaneously.

KPN is in its first phase of moving to an IP-everywhere environment for corporate customers. The company aims to move to an all-IP core backbone by 2007, with Ethernet in the access network by 2009. ATM (asynchronous transfer mode) and SDH (synchronous digital hierarchy) will be phased out of the network by 2010, completing the move to IP. KPN’s head count is expected to fall by 8,000 full-time equivalents by 2009.

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Figure 2: Traditional vs. next generation networks

Characteristics	Traditional	Next generation
Convergence	Absent	Inherent
Services	Single	Multiple
Network	Multiple	Single
Network access mechanisms	Single	Multiple
Network access speed	Primarily narrowband	Broadband capabilities
Network building blocks	Dedicated	Reusable
Network management	Less centralized	Centralized
Product development	Slower	Faster
Service delivery & assurance	Slower	Faster
Interfaces	Closed	Open
Customer experience	Complex to adjust & less personal	Less complex to adjust & more personal
Regulatory compliance	Rules clear	Rules a “work in progress”

Compared to traditional networks, the innovative characteristics of next generation networks appear likely to improve revenue yield per unit and to reduce fixed costs.

If we accept in principle that all incumbents have little choice but to follow the likes of BT and KPN and build NGNs, then the question is to what degree they do so and over what time frames. We believe operators need to ask themselves eight basic questions before embarking on the path to transformation.

1. How much can I extract in cost savings?

The migration of traffic from traditional networks to new networks (principally IP and mobile) is reducing utilization levels and creating operational and financial inefficiencies, which feed a vicious spiral of rising unit costs and reduced profitability. The fixed NGN business case is primarily about stripping out inefficiencies. Some commentators see incremental revenue growth opportunities as the icing on the cake while others see it as a distraction to the real driver for change—cost reduction.

If operators can streamline processes, reduce head count by rationalizing existing network assets, and efficiently introduce NGN technology to replace legacy assets, then migration to NGN may realize substantial cost savings. These are big ifs; however, the upsides are also big.

For most operators, capex falls in the range of 10% to 15% of revenue; opex is typically three times the level of capex, half of which is accounted for by staff costs. Working on operational staff costs alone, therefore, successful and complete conversion to NGN allows operators to effectively reduce the cost of the operational workforce by 25% to 40%, equivalent to around 4% to 9% of revenues. Given the negative trend in fixed voice revenues in particular, this opportunity is worth taking extremely seriously.

There are, however, transition costs. Nonetheless, the overall net present value is still significantly positive. Citigroup Investment Research illustrates this point well. For a typical EU incumbent, they estimate that in the migration phase, free cash flow margins could fall by three percentage points (two percentage points of increase in capex and one percentage point due to incremental opex). Citigroup's research does point out that post-transition, free cash flow margins could be enhanced by up to 16 percentage points, though this appears quite aggressive.

2. How do I manage my people to ensure that we push through transformation?

People and organizational structures are the main barriers to change. This is certainly the case in the communications industry, where each service platform is accompanied by its own support organization and power base. Simplifying and streamlining the network service platform (from many to one) represents a direct challenge to the established order. To get close to achieving the potential benefits of network rationalization requires dismantling long-established organizational structures and work practices, while at the same time building a new service organization.

A robust business case will need to factor in:

- The cost of redundancies.
- Retraining/recruitment of staff with hybrid legacy and IP skill sets.
- The costs of and time frames needed for the effective rebuilding of the organization.

3. How attractive is my regulatory environment for NGN?

Before embarking on any significant NGN investment, an incumbent needs an established regulatory framework. Embarking on NGN deployment without regulatory certainty is a risk that operators should seek to avoid. It is critical that the incumbent fixed operator reach agreement with the national regulatory authority, either on an NGN amnesty or at least on technically feasible points of access that do not destroy the business case for investment in NGN and ensure that the allowable cost of capital reflects the migration risk.

Incumbents also need to steer clear of onerous obligations relating to alternative operator migration costs but at the same time adhere to any regulatory principles that the national regulatory authority has established.

4. What kind of experience are my customers crying out for, and will NGN help me address their needs?

The benefits of convergence are clear for operators in terms of cost reduction. More elusive, however, is the question of how close operators are to using NGN to match the experiences customers demand. For instance, deploying NGN access gateways and controllers needs to do more than just offer the same functionality over IP.

The operator must understand the customers' needs—for quality of service, service level agreements, etc.—that NGN can address, identify its target segments, align its product offerings, and develop an appropriate channel strategy. Otherwise, it will acquire the wrong customers, increase churn, allocate resources to developing the wrong offers, and fail with its distribution strategy.

Understanding the customer environment and taking a customer-centric rather than a network-centric approach to the services from which customers will derive value, and deliver loyalty to their provider, are key. The introduction by BT of the Home Hub and by France Telecom of the Livebox are interesting steps in this direction, providing, as they do, a beachhead from which incumbents can reach out to their customers.

The BT Home Hub is an asymmetric digital subscriber line (ADSL) router with wired Ethernet, USB, and wireless 802.11b/g computer connections. Customers can connect up to five DECT handsets and use them to make voice over Internet protocol (VoIP) calls. There is also one fixed VoIP socket for connecting the current telephone to the BT Home Hub to make VoIP calls.

The Livebox is a combined wireless router and modem with a socket to plug a phone into to make cheaper VoIP calls. In July 2006, France Telecom inaugurated its Livebox Lab, an innovation nursery for Livebox and all its partners to assist with the blossoming of an open Livebox “ecosystem,” in line with France Telecom's convergence strategy.

5. How old is my existing network and how mature is the replacement technology?

The age of the operator's network is critical to the speed of migration. If the operator has a significant subscriber base on analog or semi-digital technology, then migration through legacy digital technology makes little sense.

Even if the operator is fully digitized, vendors may no longer support the software and hardware releases. And migration to more recent TDM (time-division multiplexing) or NGN technology could be required for meeting regulatory requirements, such as number portability or carrier preselection. On the other hand, if an operator has deployed a modern network recently, migrating to NGN too early will lead to stranded assets and a significant write-down of network value.

Fixed networks have become very complicated, with the overlay of useful and redundant architectures alike. NGNs are designed to strip back complexity. Nevertheless, operators need to proceed with caution. Carrier-class NGN technology is not yet as stable as many vendors would like to make out, particularly Class 5 equipment that handles retail customer services, residential gateways, and, of course, the IP Multimedia Subsystem (IMS) platforms, which are still evolving.

Indeed, how operators align their IMS implementations with “Web 2.0” applications, or second-generation Internet-based services, is still a conundrum. Operators need to ensure that they are deploying proven technology, executing exhaustive lab tests before piloting, and building in a clear migration path so they have wiggle room later.

6. What state are my business processes in and the systems that underpin those processes?

Both the business and the operational support systems are core to the NGN environment. Operators now wish to deploy systems functionality that supports multiple services, e.g., a common billing system for all services rather than individual billing platforms dedicated to specific services.

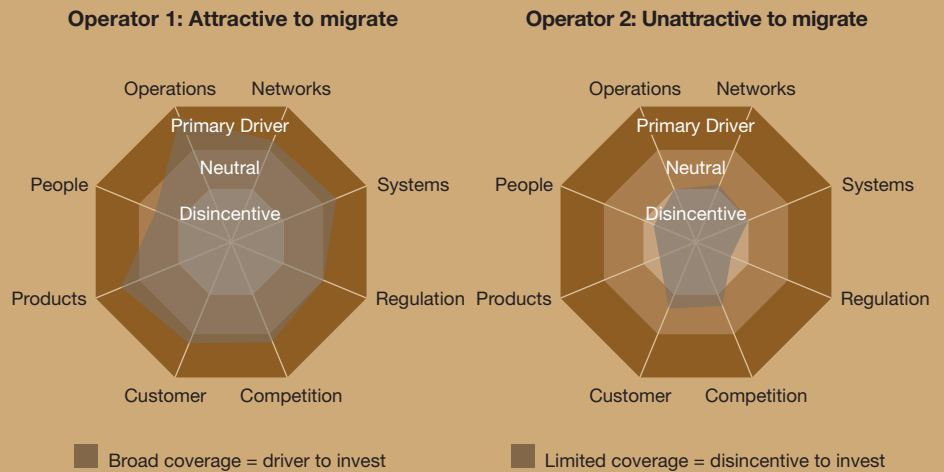
Along with the massive network and IT investment, operators face the daunting task of unpicking the crow’s nest of overlapping, broken, or even nonexistent processes across product-based fiefdoms, in which each fiefdom has had its own way of doing things.

Realizing cost savings while enhancing the customer experience and ensuring a smooth transition requires a complete rethinking of the enterprise process model. Many operators are seeking to redefine enterprise processes along the lines of the Enhanced Telecom Operations Map, a business process framework developed by the TeleManagement Forum. If handled well, this approach could deliver:

- Better customer focus due to improved alignment of supporting processes and systems.
- Less requirement for opex due to slimming down of overlapping or broken processes.

PwC 8-dimensional NGN readiness model

PricewaterhouseCoopers has developed a model that tests an operator’s readiness to embark on the deployment of NGN technologies. The two extreme cases below show the difference in the degree of urgency for two very different incumbent operators.



- Balanced and clear regulatory environment
- Old network and systems technologies deployed from a broad variety of vendors
- Highly competitive market with many dissatisfied customers
- Inefficient operator: High ratio of employees to lines
- Clear product portfolio strategy and longer-term product road map
- Flexible organization and culture

- Unclear regulatory environment
- Relatively new technologies already deployed, based on solutions from a few vendors
- Low level of competition with limited customer expectations
- Efficient operator: Low ratio of employees to lines
- Unclear product portfolio strategy and limited product road map
- Rigid organization and culture

- A framework of key performance indicators that encourages continual improvement in performance.
 - Agnostic business data on products and services that speeds up the deployment of new services.
- The rate of change should be dictated by how fit for purpose the current systems architecture is and how costly it is to run.

7. Are my rivals driving me down the road to NGN transformation?

The degree of competitive rivalry drives how much additional functionality an operator needs to add to its infrastructure to grow ARPU (average revenue per user)

and limit churn or how many costs it needs to strip out to sustain margins. For instance, if customers are migrating from fixed to cable, what attributes must the incumbent add to stop migration in its tracks? Based on current solutions, NGN as it stands in many cases may not be the answer unless an operator is able to extract enough costs that it can compete better on price.

8. What kinds of products can NGN really provide? Does it just offer more of the same, except over IP?

Operators need to be careful that NGN is not simply carrier-class voice delivered over a packet network. On the other hand, a lack of clarity remains around

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services that operators will offer. Apart from the usual suspects, it is unclear where the additional revenue will come from. How many endless slide packs have we all seen that tout instant messaging, push-to-talk, and location-based services as the primary services?

Clarity concerning the shape and composition of the product portfolio, tailored for key market segments, can help operators get more from this network transition, spare capex, and provide a road map that guides the evolution of NGN.

Conclusion

Operators can use the benefits of NGN to reduce operating costs, decrease capital expenditures, and grow incremental revenue. Nevertheless, as the technology is still evolving, operators need to take a pragmatic approach to challenges:

- Focus on deploying technologies that can increase your scale while taking costs out of the business to become the lowest-cost provider. If you are unlikely to be able to attain the position of lowest-cost provider, then leverage yourself off the deployments of larger NGN players and seek to differentiate yourself through innovative services.

- Steer clear of the “half pregnant” approach to new technology deployment. Test new technologies in the lab, conduct pilot tests, and if they work, aggressively deploy them. If you don’t, you will just end up managing even more platforms than you did before.
- Clarify a common vision for NGN services across the business and then focus on exploiting any unique capability and specialist expertise the business has to offer to realize these services.
- Work through the impact of how massive transformation of the network affects the competitive environment and what the regulatory implications are.
- Make sure you have regulatory certainty before committing to huge investments that may end up serving less as your desired means of transformation than as a springboard for another operator to create value.

Failure to address these challenges before embarking on NGN transformation is equivalent to placing your shareholder’s money on red and just hoping for the best.

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