

28 October 2003

Network Access Group
Commerce Commission
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Wellington

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Subject: Submission to the Commission's Review of Local Loop Unbundling

Dear Sir/Madam

Alcatel is pleased to be able to contribute to the Commission's review of arrangements and regulations for the provision of local loop unbundling in the New Zealand market. Alcatel is a global provider of telecommunications technologies and services, operating in over 130 countries. In New Zealand, Alcatel is a supplier to a number of telecommunications service providers, including Telecom NZ and TelstraClear. As a neutral player in the deliberations of the Commission, it is our desire to ensure that regulators of the telecommunications industry are well informed of global trends in technology and how these trends relate to the potential investment decisions in this industry, in New Zealand.

From Alcatel's perspective, the most significant new investment that will occur in the near future in New Zealand is the establishment of Next Generation Networks. The Alcatel New Zealand submission has been prepared to provide a guide for your deliberations on this important issue, in the context of local loop unbundling. We see Next Generation Networks as a critical enabling infrastructure to deliver to any community the much-promised productivity that the hype of "convergence" has been thus far unable to realize. Our submission provides an overview of trends in Next Generation Networks globally, what strategies are driving these trends and how they relate to regulation in those markets.

Should the commission desire further information and understanding of these trends, or perhaps a better understanding of Next Generation Network technologies and their regulatory linkages, it would be our pleasure to provide a briefing session at your convenience. We would make available experts who can outline some of the regulatory issues linked to these trends and the impact of "Voice over Internet Protocol" in general.

For further discussion on this paper, the contact points in Alcatel are Charles Jarvie, Chief Technical Officer Alcatel New Zealand (+64 4 806 5206) and Robyn Bern Marketing & Communications Manager Alcatel New Zealand (+64 9 306 0186).

Yours sincerely,



NEW GENERATION NETWORKS

Discussion Paper

STATUS OF NEXT GENERATION NETWORK EVOLUTION TRENDS

SYNOPSIS

This paper is a summary of some of the global trends that Alcatel sees in the evolution of strategies to deploy Next Generation Networks. The intent of this pack is to provide a broad industry insight into why these trends are occurring and the interaction of regulatory factors on investment into Next Generation Networks.

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1. Background and Overview

1.1 Background

This paper provides Alcatel’s perspective on current strategies and trends for the deployment of voice services by carriers around the globe. As a leading provider of Next Generation Network (NGN) solutions to the telecommunications industry and operating in over 130 countries, Alcatel has an insight into what carriers and service providers around the world are considering for the evolution of their voice service infrastructures.

Alcatel has contributed to the deliberations of regulators in many markets in recent years, as we are well placed to provide views on global and technology trends. For example, Alcatel filed comments with the FCC for its Triennial review and provided briefings for the commission and its staff. It was also a founding member of the High Tech Broadband Coalition, a group representing the interests of the broadband technology industry, which was credited as a major influencer on the FCC’s rulings in the broadband domain. In Europe, Alcatel is a leading member of all high level dialog structures established with the European Commission, in particular the “Brussels Round Table” (CEOs of the major incumbents and vendors in direct dialog with Commissioners on the evolution towards broadband), through EICTA (Europe’s ICT industry association where Alcatel chairs the Task Force on “eEurope 2005”), as well as in the GBDe (Global Business Dialog on e-commerce) where Alcatel leads the working group on the “Impact of Broadband on the Future of the Internet”. Alcatel is also active in individual Member States such as in France where we encouraged and obtained the first Industry-Government dialog on the impact of “Telecom meets Content” (a direly needed roundtable bringing together Ministers, Operators, Broadcasters, Content owners, Consumer electronics and Vendors).

Our aim in submitting this paper is to provide the Commission with an understanding of some of the issues that might link Local Loop Unbundling regulation to investment into Next Generation Networks.

1.2 Overview

There are two areas examined in this paper. The first is how the telecommunications industry initially approached the deployment of NGNs to provide voice services and the second, a discussion of the current approaches and the regulatory policy related positions - both of which are highly market dependent.

As an integral global player in the telecommunications industry, Alcatel works with carriers that are either planning to invest in NGN technologies, have extensive trials, or who have initial deployments underway. We have used our experience with and observations of these projects to give the reader an understanding of the current status of NGN deployment plans and why it is that they are this way. For confidentiality reasons, we have not revealed the identity of all carriers that are the subject of this report.

We have also included our internal analysis of the regulatory conditions and policy thinking with potential relevance to NGN taken from ongoing debates and changes in the regulatory regimes in the US and in Europe.

This report does not examine the status of deployment of VoIP technologies in International networks, which are driven by other economic and socio-demographic criteria.

1.3 Environmental Context

The economic and industry environment of today is quite different to that in which the investment decisions that underpin today’s telecommunications networks were made. The advent of the internet and the evolution of adjacent industries is leading to a convergence of the Information, Communication, Entertainment and Telecommunications industries that will have profound impacts on the nature and types of service that will be delivered to consumers and businesses.

Already, the telecommunications industry is demonstrating a shift in the ways in which the value chains for delivery of services are constructed. We have seen quite different partnering models put in place in many markets, with carriers shifting responsibility for many aspects of the management of their infrastructures to their vendors. Whilst there is a good example of this in New Zealand with Telecom’s decision to partner with Alcatel and Lucent, we have seen similar models emerge in Australia between Ericsson and Hutchison. Alcatel has similar relationships in place in Europe and South America.

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The high capital investment nature of telecommunications infrastructure is also leading to different models being applied for determining the business case for new services. With shorter terms being required for the return on capital invested, carriers are seeking to generate sufficient economies of scale in the core networks that link their services. Among other things a major strategy is to also seek to leverage a wide scope of services across their access networks, where the highest and most efficient capital investments occur by utilising multi-service technologies and ensuring there is sufficient return on each initial and subsequent incremental investment made. Typically access network investment is more localised to a specific area. These demands are not only driven by more responsible economic management of shareholder and social capital, but also by the need to compete more effectively against both other infrastructure providers and the other competing service distribution mechanisms arising from industry convergence.

1.4 What is a NGN?

'NGN' loosely refers to the various infrastructure manifestations of strategies that replace current PSTN voice-optimised networks with an integrated IP-based multi-service delivery capability. A NGN is the evolution of today's traditional telecommunication network to a network based on significantly more advanced technology. It can also be thought of as a shift from a mix of circuit-switched and packet-based technologies towards a mix of packet-based technologies.

A NGN has been created by the need to deliver multiple services to customers over a single network. In that sense we can consider a NGN to consist of two major parts: The access network and the core network. Unifying these network parts is the underpinning technology basis for the NGN's packet-based approach. This is the adoption of the Internet Protocol as the basis for NGN. IP is an excellent multi-service technology made famous by its use within the Internet. Whilst the Internet is a mass-market service and infrastructure in its own right, it is not the NGN. A NGN offers a wide set of services with differing grades or quality of the service delivered – only one of these services will be the Internet. Importantly, a NGN will seek to create an IP path between each customer and the applications or services they wish to have delivered. These services can and will include:

- Voice
- Entertainment (ie Video, Games or similar)
- Information or news
- Security Monitoring
- Interactive services eg conferencing, education or health services
- Peer-to-peer mass data exchange

NGNs can be perhaps put into context as the commercial delivery mechanism for much of the promised hype of the Internet. Whilst there will still be many social benefits delivered from widespread access to Internet services, NGNs will present a more viable commercial and technological basis for the sophisticated and productivity enhancing services that have been discussed over the last decade as the benefits of 'convergence'.

An important requirement for a NGN will be the deployment of a broadband access network. This is because the IP protocol, and the multiple services on which the economics of the NGN depends, require substantial data capacity. A variety of technologies can be used in broadband access. The most common of these at present is ADSL as it is able to most effectively utilise the Copper based access networks that are nearly universally deployed in developed markets. Other technologies such as Fibre to the Home (FTTH), satellite, radio and the technologies used in cable TV will also be used for NGNs. Any access network has a substantial proportion of the investment dedicated to individual customers. Furthermore the access network investment levels generally outweigh the core network investment requirement.

Core networks will also need to evolve to support NGN but the investments required do not match that needed for the access networks and are inherently shared across many regional access networks and services anyway, making the return on these investments clearer. Included in this category of core networks are the key technology enablers for the end-to-end service such as user authentication and resource allocation management that will provide much of the "brains" of the service delivery activity to customers. It will also include the underlying IP and transmission network infrastructures that link the national and regional access domains together.

A big issue in NGNs will be the future support for voice services since carriers are today generating significant revenues from their traditional voice services. Within a NGN, a voice service can be greatly enhanced, but the distinction between voice and any other real-time information service will cease to be important in technical

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terms, which may result in contentious regulatory issues. Without question though, voice on a NGN is still a voice service and many of the regulatory requirements for voice services will still be required eg access to emergency operators, legal interception. Of similar importance will be the imperative for adopting new business models in the communications sector to enable the major actors (and investors) to compensate foreseeable growing loss in traditional public voice services (for example at interconnection) by services higher in the value chain (packaging TV, video, interactivity, voice and data).

The other enabling capabilities that will be required for NGN deployment are in the areas of security and the management of quality of service. Within circuit switched networks, many benefits are taken in the security of the twisted pair Copper wires that isolate services to a common point deep in a carriers' network. These characteristics need to be emulated in IP based networks and this will require complex investments at several points in a NGN to protect users and the carriers from malicious attacks. This will include the "network" equipment that may be located on the customers' premises to ensure that the interface between the customer and its service provider is "trusted". However, in substance, security and QOS will be managed by software in the core network. Similarly, management of multiple services will require specialist technologies that can differentiate the needs of different services of the common resources within a NGN. These investments are a major enabling step over and above the initial investments in Internet access that is provided by Internet Service Providers today. Enabling technologies such as the above are distributed across both the core and access networks of the NGN.

2. History of the NGN Approach

2.1 Initial Strategies

In the mid-1990s, as the Internet began to commercialise and the promise of rich new services based on data technologies like ATM and IP emerged, the realisation that much of the technology that supported the existing voice networks of the world was rapidly approaching the end of its economic life and the justification to consider replacement technology became a high priority. This thinking was centred on the need for local switch replacement, but encompassed the emerging congestion in metropolitan and regional networks for the carriage of data services like Dial-Up Internet Access.

Early views on this strategy were to utilise ATM technology to emulate the equivalent voice service transport across the network and centralise the “servers” that enabled the voice service. It was envisaged that a modernised voice network would have a small number of concentrated switches close to customers, with only ATM networks linking them together. The rapid growth of data networks and the increasing need to increase voice network investments purely for the carriage of Internet dial-up services created a driver for the sharing of transmission facilities for both voice and data. This requirement could be more effectively met using such an approach and it was effectively a cost reduction strategy. There were few plans for the replacement of the line interface technologies, which constitute the bulk of the investment in traditional voice networks (often referred to as the Public Switched Telephone Network (PSTN)).

At the same time, carriers in well-developed markets were also seeking to find new services. Often capital was directed at the expansion of these new services, usually based on Internet technology. Nonetheless, several tandem replacement projects were undertaken in various markets ie the de-commissioning of a circuit-switched or Time Division Multiplex (TDM) technology based core network switch and establishment in its place of an ATM based switch to carry the largely toll tariff voice traffics of a regional or national network.

2.2 What Changed

Despite the considerable progress made in technology development for NGN in the late 1990s, these plans were largely deferred as the access to capital and economic growth dried up in the early 2000s. With little incentive to invest in new services, investment for NGN was dependent upon a well-founded business case for operational cost savings or capital avoidance.

In 2001/2002, a study known as the Dittberner Report, which interviewed 35 carriers around the world assessed that at that point:

- 50% of carriers were planning some form of NGN investment in the next 18 months
- 88% had budgeted funds for NGN investments in the next 3 years
- 80% planned investments in NGN for their transit/toll networks only ie not local switch replacement

In 2002 and 2003, this clear trend away from local switch replacement has continued. As there is significant capital required for local switch replacement, many operators have been unable to prove that there are sufficiently large operational cost savings possible from reductions in the number of PSTN switches or in the converged architecture of a NGN.

What has emerged comprehensively is the market for sophisticated IP based voice and multimedia services. With the initial advent of the H323 protocol for multi-media services like conferencing of voice and video, niche service providers or innovative carriers in some markets are meeting a trend for enhanced voice services support. This is beginning to impact on the market for some higher value traditional voice services like Centrex. A lower cost multimedia protocol, SIP, has also become a more likely basis for cheap and easy access to these multimedia services over broadband IP technologies like ADSL.

In the same timeframe, incumbent carriers have begun rapidly deploying ADSL to enable high-speed internet services. In many markets, the penetration of ADSL is becoming sufficiently large to generate a new portfolio of higher value services in addition to basic Internet access. It is upon this basis that many new voice services are being focussed. The technology basis of NGN has thus become IP rather than ATM, and a range of Voice over IP (VoIP) approaches are in trial or deployment around the world.

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3. Current NGN Approaches

3.1 Overview

Essentially, there are really only three approaches or strategies that we are observing. These strategies depend very much upon the underlying nature of the growth of traditional voice services, since deployment of new infrastructure to accommodate voice service growth is a primary investment driver for a carrier.

These three approaches are:

1. *Augmentation or Upgrade of PSTN switching approach.* Under this approach, the traditional TDM switching system being deployed is augmented or upgraded to enable basic PSTN-like voice services to be deployed using VoIP technology.
2. *Overlay of VoIP Technology.* By minimising use of traditional voice switching systems, new VoIP technologies are deployed with initially minimal PSTN voice service support as an overlay to the traditional TDM based voice services.
3. *Replacement of PSTN Switches.* With this approach, the carrier replaces its existing PSTN switches with all new VoIP.

3.2 Markets with Strong Growth in Traditional Voice Service

Carriers serving these markets are continuing to make significantly large investments in voice service infrastructures. Typical examples of this are in parts of Asia, Mexico or South America. Selected areas of the Eastern European countries are also good examples. It is not uncommon for these markets to be regulated to provide competitive telecommunications service providers, but generally a strong incumbent operator is in place.

The strategy adopted here is to redirect investment that would otherwise go into PSTN technology so that the newest infrastructures will also support both traditional voice services that are the bulk of customer demands today, and the newer multimedia services that are emerging.

This strategy tries to maximise the access to the newer services by the existing infrastructure footprint by upgrading existing switches at an appropriate time in the future, but ensures that all new voice serving infrastructure is essentially able to also support the SIP and other VoIP protocols.

This in effect is approach (1).

3.3 Markets with Maturity in Traditional Voice Service

In markets with fairly stable growth, the issue carriers face is managing the demand for new and innovative services versus the emerging need to renew the base of their legacy TDM voice service infrastructures over time. Typically, mature markets have several competitive service providers, with the incumbent operators in control of the access network by nature of historical monopolies. Competitive access providers are also often in place, however the nature and form of competition varies greatly from market to market.

The predominant approach they adopt is approach (2). There is no substantive attempt to deploy the sorts of services that are traditionally offered on the PSTN, as in many cases the PSTN is still available if these services are required. This approach is in response to competitive and revenue growth priorities, but does introduce the NGN in all aspects of the carriers' supporting infrastructure ie service and network management. As such it is a sensible initial strategy for NGN deployment and will require investment across the extent of the network coverage of the carrier. In effect, this strategy allows the carrier to generate extra value from its broadband network investment, without the need for replication of current PSTN features. It also recognises the reality of the need to support the marketplace evolution of the voice service from being about voice communications to a more multimedia experience that is driven more from the customer domain.

By establishing its NGN core network first, the flexibility remains for the service provider to invest in its access networks as it see its market priorities. In many markets this is driven by the need to respond to competition for access provision, however the economics for total service infrastructure will be spread across a planned investment for its complete network. As such, the significant fixed costs that are established mean there will be an added overhead in managing the risks resulting from the service models that might be affected by regulated access to elements of this investment.

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Alcatel has customers in Europe and three large customers in North America that are investing strongly in this approach with substantive trials being undertaken.

Where retirement of the basic PSTN infrastructure becomes a priority due to the nature of higher expenses it is incurring in this technology, approach (3) has become a consideration. At this stage there are only a very small number of carriers considering this approach, as it is a significant investment and requires highly complex projects. The complexity arises from the need to more closely emulate the services that are being delivered today as precisely as possible so that the disruption to customers is minimal. For this reason, many carriers adopting this strategy are initially focussing on the tandem/transit switches of their networks where they can also avoid incremental investment in TDM switches and learn the new NGN technologies without having to replace local switches. Retirement of local switches is also more likely to need a business case that is more tightly linked to new revenues from the NGN services that can potentially be delivered by the new technology.

Markets with high penetrations of the more sophisticated PSTN services such as those provided under the Custom Local Area Subscriber Services (CLASS) definition from the US market (eg Call Forwarding, conferencing etc) present a major challenge in adopting approach (3) at the local switch level. This arises from the complexity of emulating these services in NGN, but also due to the difficulty in generating higher average revenues from a customer base that has already adopted a richer set of services.

At this stage, Telecom New Zealand is seen as a global leader in this approach as it will be among the first incumbent operator to invest heavily in replacement of its local switches. In moving early Telecom is exposed to significant investment and deployment risk from the evolving nature of the new technologies of the NGN. Whilst comprehensive risk management strategies are in place, Telecom must seek to balance these risks against the need to establish a solid foundation for the delivery of the services that NGN enables so as to ensure it is competitive as a whole in this era of convergence across industries.

4. Regulatory Factors

Regulators in many markets are grappling with the best approach to take in analysing the potential regulatory issues linked to NGN services. Fundamentally, NGNs are an evolution of the investments that carriers are making into broadband access. It is important to recognise the basis for the business case that a carrier will develop for broadband and NGN is based on leveraging its economies of scope and scale in both the services it offers but also the geographies they serve. Balancing the need for regulated access of telecommunications infrastructure to competition for the encouragement of new entrants to the landscape is a difficult proposition in an era of considerable economic and industrial evolution. This difficulty lies mainly in the inherent market and technical risks that these carriers are already taking in the deployment of these technologies.

US Market

Within the US market, the approach that has been taken at the Triennial Review of telecommunications regulations by the Federal Communications Commission (FCC) is an interesting reference point. In this case, in announcing its draft findings in February 2003, the FCC recognised that uncertainty in broadband investment was constraining investment decisions by incumbent local carriers. Key aspects of the FCC findings are:

- The FCC has formerly recognised the difference between broadband networks and legacy networks;
- The FCC's assessment considers the impact of unbundling of network facilities on investment;
- Provision for exemption from unbundling of investments in FTTH, new build areas and for hybrid Copper/Fibre deployments within the access network;
- Identified the need to differentiate between elements in Hybrid Copper/Fibre access networks that deliver broadband services. In this case, the FCC included within its exemption, Next Generation Digital Line Concentrators (NGDLCs) that are deployed to enable broadband. The definition of NGDLC specifically included the ADSL Line Card.

As a result of isolating and preventing regulated access to FTTH investments and new build areas, the FCC triggered a wave of focus in this area by these carriers. Subsequently, three of the carriers launched a tender process for the selection of FTTH technology that they are seeking to deploy in large volumes from 2004. Importantly, despite ongoing finalisation of the Triennial Review and the potential impact of State regulators on the implementation of details within the review, a large number of carriers in the US are proceeding with shifting investment into the various capabilities to deliver a mix of voice, internet, data and video services to their customers IE the intrinsic investments for the NGN core network and service management that are critical to NGN deployment.

The other issue that arises from the Triennial Review is the debate around whether VoIP is a voice service or a data information service and therefore how regulations should be drafted to cover this new service. The landmark case that is testing this dilemma is Vonage versus the Minnesota State Public Utilities Commission (PUC). In this case the PUC has determined that VoIP should be regulated as a voice service and required Vonage, a pure VoIP provider that operates across the Internet exclusively, to conform with the state's PSTN regulatory framework. Vonage appealed this direction and on the 8th of October, 2003, the Minnesota Federal Court barred the PUC from applying traditional PSTN rules to VoIP. Specifically, the Federal Court has noted that Vonage's service is not a "phone to phone" service, as it does not conform to conditions 2 and 4 of the 4 conditions that the FCC identified for such a service, ie:

1. It presents itself to the market place as a phone service
2. It does not require a change of CPE for the service to be used
3. It allows number with the US Numbering Plan to be called
4. It transmits customer information without change of form or content

This decision validates the argument that VoIP (and by implication, many aspects of the NGN) will be a different service to the PSTN (although it has the same voice functionality).

In contrast to the US environment, the European Union (EU) has begun specific regulatory discussion of the implications for NGN. In analysis to date, the EU has recognised that NGN represents a fundamentally different and more complex paradigm to that of the TDM networks they have previously focussed on and that it is too early to implement NGN specific regulations.

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The European Commission published earlier this year a study on the regulatory implications of NGN. The purpose was to prepare for next steps in their communications policy following the implementation of the new regulatory framework for “electronic communications and communication networks”. Two basic policy principles impact the Commission’s view on how to approach NGN. First of all, the new framework shifts regulatory focus from technologies and service-dependent networks to the study of “relevant markets” seen primarily from commercial, end-user perspectives. Secondly, Europe has adopted a technology neutral approach towards sector regulation by putting an end to issuing national, operator network-specific class “licenses” (eg GSM, fixed networks with or without public voice services). The notion of licence is replaced by “general authorisations” open to any “undertaking” playing a commercial role on end-user markets (be they operators, service providers, ISPs, TV broadcasters, or cable network operators alike). This move, which in-differentiates the type of infrastructure, network or services used or offered by an undertaking, has notably prepared the field for the introduction of hybrid networking solutions such as those inherent to NGN.

Evolution of EU regulatory policy regarding infrastructure investment:

During the first phase of the EU’s “deregulation” process (1998 – 2000), a clear priority was given to “infrastructure competition”. Licence-based restrictions obliged new entrants to rollout their own infrastructure, regardless of the type of technology and communication service being offered (PSTN, 2G, WLL, 3G ...). Moreover, certain Member States barred their incumbent from providing entertainment services to protect cable network investments (eg BT in UK). New entrants were given limited access to incumbent facilities (mainly through interconnection agreements monitored by the regulator for “non-discriminatory, cost-based” practice). The generally accepted (expected) business model was “wholesale access prices” for competing network operators and “retail service prices” for service providers (eg ISPs). During the transition period towards the new framework (2000-2003), the so-far apparent failure of phase 1 regarding infrastructure competition in access networks has lead to attempts to stimulate competition via greater regulatory interventionism leading to “mandated access” through LLU regulation. In follow up, the EC introduced the definition of a new potential relevant market - “Broadband wholesale” (mainly focussed on bitstream wholesale ie a data service) which is currently under analysis by the National Regulatory Authorities in the 15 Member States. In 2003, further pressure in access competition has lead a certain number of regulators to reconsider mandating access to network elements, to mandating access to services (typically as a data service) and by allowing local governments to equip underserved areas with broadband infrastructure (using public funds). However, it has now become obvious that reduced rates for incumbent retail/wholesale broadband products have discouraged investment in competing access infrastructure and even rendered LLU less attractive. Incumbents have also come to terms with the new market conditions and are realising their advantage in encouraging wholesale while maintaining control of the access line, creating even further dependency of smaller market players on their essential facilities.

The current dilemma is how to ensure that such mandated access (called “access competition” as opposed to “platform competition” based on alternative infrastructure) does not threaten the obvious need for continued infrastructure investment by incumbents as well as new entrants. “National regulatory authorities need to balance the rights of an infrastructure owner to exploit the infrastructure for its own benefit, and the rights of other service providers to access facilities that are essential for providing competitive services.” (EC Access Directive, Recital 19). Voices have risen to challenge the long term business model of access based competition, and proof from the field shows that the only successful challengers in access have deployed and continue to deploy their own edge and access equipment (including DSLAMs).

Another basic question is the impact of artificially imposed market conditions (usually using pricing based on cost-based Long Run Incremental Cost (LRIC)) on innovation. The status of an “emerging market of new services” has yet to be defined, but it is most likely that the regulator will have to adapt and admit a clear “hands-off” approach if the promises of strong growth in the converged world of Information, Communication, Entertainment and Telecommunications are to be achieved.

In the long term, it is generally pro-competitive and in the interests of consumers to allow a company to retain for its own use facilities that it has developed for the purpose of its business. For example, if access to a production, purchasing or distribution facility were allowed too easily there would be no incentive for a competitor to develop competing facilities. Thus, while competition was increased in the short term, it would be reduced in the long term. Moreover, the incentive for a dominant undertaking to invest in “efficient facilities” would be reduced if its competitors were, upon request, able to share the benefits.

In the new world of NGN, the recent EC study on the regulatory implications of NGN has concluded that in any case, the potential “control points” (anti-competitive barriers) will certainly shift from the network layer to higher layers in the value chain, pinpointing in particular “customer ownership”, “OSS access”, “application layer access”.

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The study concludes with a number of statements that stress the need for a precautionary approach to discussing possible NGN-related regulation:

- It is still too premature to act against the new “sources of power” (resulting from telecom meets content)
- There will be a strong shift of competition from network to service/application level
- Policy makers need to understand the impact of new technologies (in particular Customer Devices and Information Systems which are becoming the predominant determinant of customer value from network services)
- There is a need to create awareness on new behavioural patterns of actors in newly converged markets
- Evolution of the sector will require a new policy “development programme” (pooling expert resources at EC level from a larger number of different DGs – Information Society, Competition, ...)

Australia

The Australian market has created a large number of service providers that leverage the wholesale ADSL service provided by Telstra. The pricing and regulation regime does recognise both access to unbundled local loops and frequency sharing, however to date, few carriers have taken this latter option due to the need to provide costly filtering technology on each line. This has resulted in a disproportionately large number of “resellers” of ADSL in Australia by any measure of comparison to other markets. Recent pricing changes announced by the Australian regulator may shift the economics of deployment for services. This may change if resellers achieve an economic critical mass at individual exchanges which would justify them installing their own technologies using unbundled copper local loop to then become facilities based operators - this may have a negative impact on the incumbent's economics.

Summary

The wide spread availability of a broadband access network means the potential to offer voice services to customers, either as a NGN service or as a voice service on the internet, will become more prevalent. The nature of regulation of voice as opposed to the PSTN will thus need to shift. Key areas that need addressing for VoIP and NGN are the support for areas such as legal interception and emergency services access. Whilst these add to the cost and complexity of the service to consumers, they are intrinsically linked to both the current views of a voice service and the sensible needs of the community in general. Similarly numbering management, or more appropriately address management, will need specific regulatory supervision. At some point, regulated interconnect as opposed to internet peering rules will be needed to link competitive NGN providers.

Other areas that will need broader regulatory focus will be in the security and privacy requirements of services such as voice once they are carried on NGN or the Internet.

5. Alcatel Perspective

As can be seen from the sorts of services that NGNs will bring to the markets they are deployed in, we see considerable social benefit from the investments carriers are making into these technologies.

An important foundation for NGNs is the establishment of a widely deployed broadband access network. Alcatel sees facilitation of these important broadband access investments as a high priority for regulators globally. As can be seen particularly clearly from the example of US FCC, creating certainty in the degree of regulated access for broadband technologies does lead to a lift in investment by service providers.

We support regulatory approaches that simplify regulatory compliance expenses and provide investment certainty in broadband, enabling NGNs to become the foundation for telecommunications service delivery of the future. Today's guiding priority should shift from "price control" to "innovation and investment" and not pursue further pressure on market pricing models. In addition, more will be gained by allowing "integration" of service offers (in particular between unified fixed and mobile services) than from extending "un-bundling" regulation which, at best, will seriously overcrowd the market by artificially protecting the weakest players and stalling the necessary investment needed to reach to the next stage of communications infrastructure upon which the Information Society will thrive.

6. Future Strategies

6.1 Convergence of Fixed and Mobile Voice Services

The other emerging trend that Alcatel has observed is the capability that the deployment of NGN technologies enables for the support of mobile voice services as well as fixed voice services.

With many fixed network carriers also operating mobile networks, areas of infrastructure alignment that enable cost savings are always a high priority. This however depends on how easily they can be leveraged. Historically this alignment focus has occurred in the service management areas such as customer support and billing, since the network based infrastructures do not scale well in supporting both fixed and mobile services. Recently, some progress has in value added services convergence, such as messaging, has enabled many carriers to begin reviewing plans for leveraging common technology in the network itself. As an example, the architecture of 3rd Generation mobile networks are now aligning with the architectures supported for Voice on IP (eg SIP).

Deployment of NGN establishes new capabilities that will enable the control of services through the IP infrastructures that is independent of the access technologies used ie independent of whether the originating devices is based on a fixed network or a mobile network. Standardisation of these capabilities is taking place in the various standards bodies such as the Internet Engineering Task Force (IETF). Deployment of this technology will be possible in the next few years, making fixed-mobile convergence a strategic agenda item again. In many markets however (eg North America), the regulated nature of operation for carriers requires substantial operational separation between the fixed and mobile networks of the one company, thus potentially reducing the pace of change towards convergence. This topic remains an area of consideration in other markets, such as Japan.

Looking a little further out, Alcatel is monitoring the trends in the development of 4th Generation mobile technologies, which will likely be ready for large scale commercial deployment in about the year 2010. Under this technology, low cost wireless services, operating at speeds comparable to ADSL will be possible as either a fixed or mobile service using the same access network. This will enable NGN like services to be delivered very flexibly to customers, challenging the economics of current fixed and mobile networks.

7. Document Information

7.1 Release History

Edition	Date	Comment	Author
Draft 1	August 2003	Initial body focussed on an outline of historical trends and status of current plans globally.	Vince Pizzica
Draft 2	Sept-30-2003	Revised to include regulatory status and more definition of what a NGN is.	Vince Pizzica
Edition 3	October 9 2003	General revisions based on feedback from Alcatel corporate and local experts	Vince Pizzica
Edition 4	October 10 2003	Inclusion of European trends	Vince Pizzica

7.2 Glossary

ADSL	Asynchronous Digital Subscriber Line – High Speed Broadband access technology
ATM	A data networking technology for the carriage of a mix of services
DSLAM	Digital Subscriber Line Access Module is the equipment that a carrier installs in a local exchange to enable the delivery of ADSL from that exchange
FTTH	Fibre to the Home
H323	A multi-media protocol that is commonly used for voice and conferencing services
IP	Internet Protocol – the protocol that enables the Internet and makes multi-service
NGDLC	Next Generation Digital Line Concentrator – an element that is located within the access network in a road side shelter or similar construct that delivers NGN services
NGN	Next Generation Network
PSTN	Public Switched Telephony Network provides today's legacy voice services
PUC	Public Utilities Commission, which exist in each US state as a regulatory body around community services such as power, water and telecommunications
SIP	Session Initiation Protocol is the predominant technology for multi-media services
TDM	Time Division Multiplex is the underlying technology of the PSTN
VoIP	Voice on Internet Protocol. The predominant technology approach for NGN.

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