

Time for revision: The regulation of Germany's next generation networks in the light of new economic and technological challenges on telecom markets

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1. The economic rationale for regulating network access

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The economic rationale for regulating network access

Aiming for sustainable competition

In case of “monopolistic bottlenecks” sector-specific ex-ante regulation of network infrastructures is necessary to ensure non-discriminatory access.

- Primary objective of regulating telecom markets: **sustainable competition**
- Challenge: to achieve the long term goal of sustainable competition the regulator needs to encourage the development of infrastructure competition through incentives for efficient investment in alternative infrastructures
 - > regulatory intervention only where barriers to entry exist
 - > need to distinguish between contestable and non contestable markets
 - criterion: control over essential facilities
 - definition: facility cannot be replicated by reasonable means
 - ➔ regulation only if there is clear evidence that a market failure exists
 - ➔ those parts of the telecom network that are contestable do not require any regulation
 - ➔ regulation of “bottleneck facilities”

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The economic rationale for regulating network access

Competing networks

Recent technological and economic developments suggest an erosion of “monopolistic bottlenecks”, thus questioning the need for sector-specific ex-ante regulation.

- On telecom markets services and backbone network are contestable and do not require any regulation
 - Only some parts of local network may not be contestable and require some form of regulation
 - Today even monopolistic bottleneck of local networks is questionable
 - new technologies technically and commercially viable:
 - WLL, CATV networks, cable modems on HFC, WIMAX
 - > reduce fixed costs of providing a local network
 - new entrants have considerable technological advantage
 - demand for telecom services is rising significantly
 - > growing business demand for data, variety of new services (mobile services, e-mail, online-services, video-conferencing)
- > **facilitates the entry of new competitors due to reduction of entry barriers**

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2. The erosion of existing bottlenecks

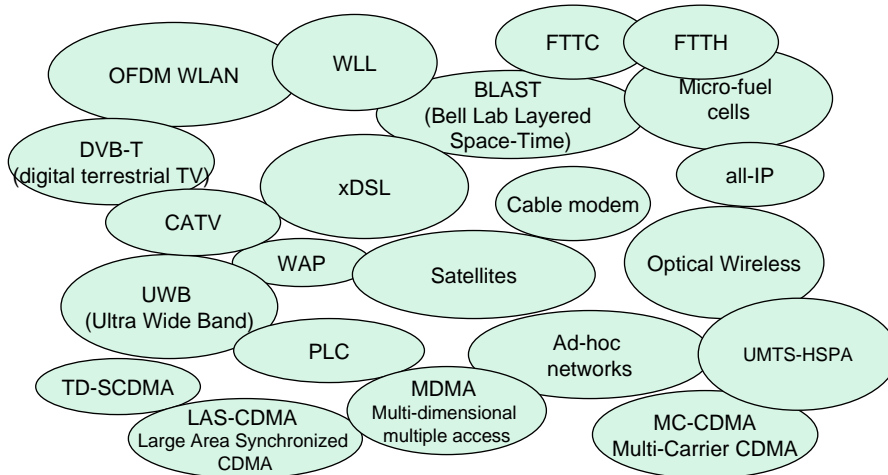
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The erosion of existing bottlenecks

Infrastructure competition based on different technologies

Infrastructure competition is already a reality today with a variety of technologies being used. Network bottlenecks will increasingly erode.



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The erosion of existing bottlenecks

Substitution by CATV operators in Germany

CATV operators - being able to reach nearly 50% of all households – have upgraded their broadband connections and realize growth rates of ~ 100% for telephony subscribers.

- Voice communication is increasingly taking place via cable TV networks
 - At year's end **2007** the number of cable connections used for telephone calls has risen to approximately **800.000** (up from 480.000 in 2006).
 - With the upgrade of the broadband connections over the cable TV network are now a real alternative to the conventional fixed network.
 - By the end of 2007 cable access was an option for 24 Mio households, with 14,6 Mio connections being upgraded to offer return channel capability (up from 8 Mio in 2006)
 - **Kabel Deutschland**, Germany's largest cable-based service provider, almost **doubled its Internet and phone subscribers to 421.000** (thereof 361.000 phone users) on March 31, 2008 compared to previous year (150.000 new customers in Q1 2008).
 - **Unitymedia**, Germany's second largest cable-based services provider, increased its
 - **telephony subscriber base by 181%** from 79.000 in Q1 2007 to 222.000 in Q1 2008 (50.000 new customers in Q1 2008).
 - Internet subscriber base by 150% from 151.000 in Q1 2007 to 376.000 in Q1 2008.

Source: BNetzA, 2008; Kabel TV, 2008; Unity Media, 2008.

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The erosion of existing bottlenecks

Fixed-Mobile substitution in Germany

Mobile services are increasingly becoming substitutes for fixed services in Germany (and other countries of the EU, thus encouraging infrastructure competition).

- Over the past years fixed to mobile substitution has become a reality:
 - A continuous decline of fixed voice traffic: In 2006 fixed voice traffic accounted for 66.54% of all voice traffic in the EU, compared to 73.26% in 2005.
 - While fixed voice revenues in 2007 in the EU were estimated at €79,4 billion (a decline of around 5% compared with 2006), mobile revenues went up to €137 billion, +3.8%). (also revenues from fixed data grew from €58.5 billion to €62 billion).
 - A large number of households in the EU had at least one mobile phone but no fixed phone any more (in Germany in 2006 around 10% of households, BNetzA, 2008a, p. 83).
 - While the mobile penetration rate in 2006 in the EU was 111,8% in October 2007, the fixed-line penetration rate is significantly lower (around 50%).
- Moreover, various trends encourage fixed to mobile substitution and mobile-only households.
 - Mobile prices per minute have gone down in recent years to little more than double the price of fixed calls (in some cases, prices are even lower than for fixed broadband).
 - Mobile networks are catching up with fixed-line providers on speeds for broadband.

Source: EU 13th Implementation Report, BNetzA, Annual Report 2007

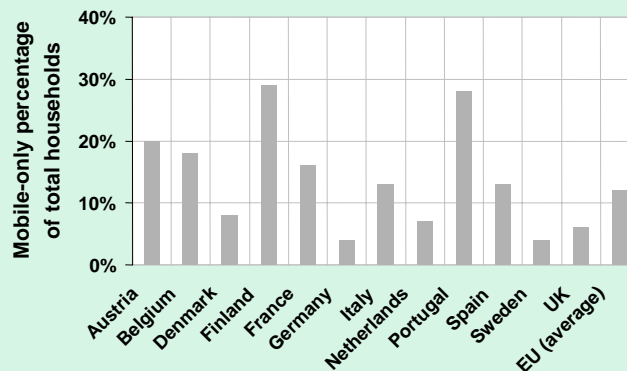
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The erosion of existing bottlenecks

Fixed-Mobile Substitution: Mobile-only users

Mobile-only users are an important indicator for increasing mobility needs



➔ The "old" narrowband voice world gets mobile! But fixed lines will have their renaissance as universal data broadband pipes in the 'home or campus zone'!

Source: European Commission, Implementation Reports

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3. The particularities of huge and risky NGN investment

The particularities of huge and risky NGN investment

New bottlenecks due to NGN access networks with FTTH ?

Future NGN access networks with fibre to the home (FTTH) may create new monopolistic bottlenecks, thus possibly requiring a renewal of regulation.

- In the near future NGN access networks with FTTH will allow for the provision of services (HDTV-standard etc.) which can neither be offered via mobile networks nor via CableTV networks.
- Due to the very high costs of FTTH a second operator will not duplicate such networks which is why new bottlenecks and therefore also new monopolies will evolve in NGN access networks.
- A lack of regulation would obstruct on a long-term basis the development of a sustainable competition-oriented market in the field of telecommunications services and/or networks.
- It has therefore to be investigated whether this will require new forms of regulation:
 - Is there a high social value of the applications requiring NGN networks?
 - Are “new markets” created which – temporarily - shall not be subject to regulation?

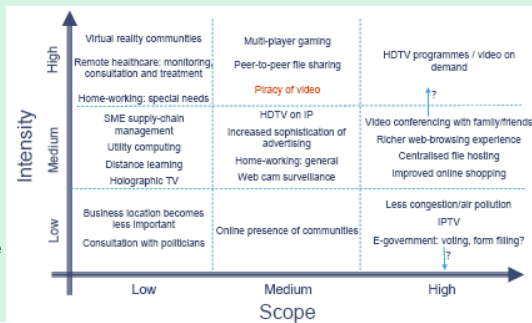
The particularities of huge and risky NGN investment

NGN with FTTH will be monopoly

For residential users only few applications require NGN networks, the social value of which is considered to be rather low.

- For residential customers only **entertainment services** such as multi-player gaming and video on demand with HDTV require access to NGNs with fibre to the home
- All other applications and services are available over current broadband access networks.
- The incremental **social value** of these applications remains **highly uncertain**.
- For example, with HDTV, research conducted in 2006 for the Digital Dividend Review suggested that consumers place little or no additional social value above private value on HDTV services.

Potential NGN applications & services



Source: Ofcom, 2007

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The particularities of huge and risky NGN investment

A need for NGN Regulation? - Examples from other sectors

Innovative high-end customer products are often offered in a (non-regulated) market environment with little or no competition.

Are Ferraris offered in a competitive "car-market"?

- Strong evidence that relevant market is the one for Ferraris
 - When applying the SSNIP test -> no substitution
 - Little past evidence that customers have switched
 - Little past evidence that other suppliers of cars have responded to the prospect of customers switching suppliers
 - Little evidence that potential competitors can rapidly respond

➔ 100% markets share

➔ SMP of Ferrari

BUT: NO MARKET INTERVENTION!



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The particularities of huge and risky NGN investment

A need for NGN Regulation? - The monopoly of patents

With investments in NGN access networks being huge and risky, there might be economic grounds for exempting regulation from these “new markets”.

- Patent protection exists for inventions in all fields of technology (esp. pharmacy products).
- Economists reckon that if people are going to spend the **TIME and MONEY** needed to think up and develop new products, they need to be fairly confident that if the idea works they will earn a **decent PROFIT**.
- Patents help achieve this by granting the inventor a **temporary MONOPOLY** over the idea, to stop it being stolen by imitators who have not borne any of the development RISK and costs.
- Yet, like any monopoly, **patents create inefficiency** because of the lack of competition to produce and sell the product.
- So economists debate **how long patent protection** should last.
- There is also debate about **which sorts of innovation** require the encouragement of a potential monopoly to make them happen.



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The particularities of huge and risky NGN investment

NGN regulation and the digital divide

Politicians and regulators must be aware that regulating NGN access will make investment less attractive, thus reinforcing the digital divide.

- The deployment of NGN infrastructure with FTTH will never be a compelling business case for an operator in some areas of Germany.
 - While it is likely that commercially led deployment will take place in urban areas this is less likely in rural areas.
 - Certain regions may remain unserved by next generation access networks.
 - The potential future boundaries of a digital divide will certainly be influenced by the **attractiveness of investing in NGN infrastructure**.
 - The more regulatory intervention investors face the less likely it will be that NGN infrastructure roll out will take place on a large scale.
 - This is because any such regulation will reduce the potential profit of operators investing in NGN infrastructure.
- ➔ Politicians and regulators must define priorities as to the extent to which they want to promote the roll out of NGN infrastructure.

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The particularities of huge and risky NGN investment

Avoiding disincentives for investment in next generation networks

With investments in next generation networks being huge and risky, the future regulatory environment must create sufficient incentives for investments in such infrastructure.

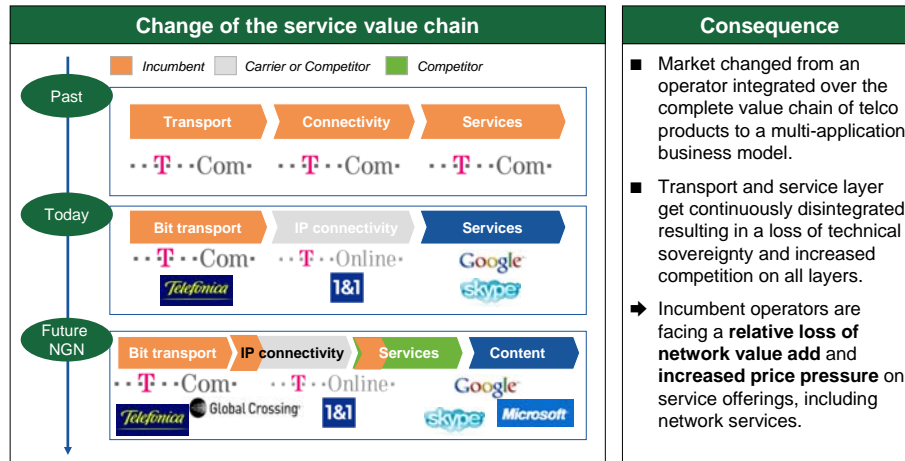
- Next generation access networks are characterised by
 - **high uncertainty** about consumer **demand** and willingness to pay
 - **limited clarity** on future **applications and services**
- In this situation, **investors** in a free market would **seek higher returns** from their investment to compensate for the higher degree of risk.
- Applying **traditional cost approaches** would not adequately reflect this higher risk profile, and therefore could be a **disincentive for investment**.
 - the approach would cap the total returns that the operator could make if demand for NGN-based services turned out to be high
but force the operator to bear all of the losses if there is no demand for such services.
- As a result, deployment of next generation access could occur inefficiently late.
- If regulators still want to intervene they may apply the **wrong risk factor** to investments
- Moreover, the business requirement to have **long term regulatory commitments** in place is difficult to realize under the current European regulatory framework.

4. The changing market environment

The changing market environment

Disintegration of the service value chain

The service value chain gets increasingly disintegrated with traditional operators facing a loss of control. This in return will increase competition on all layers.



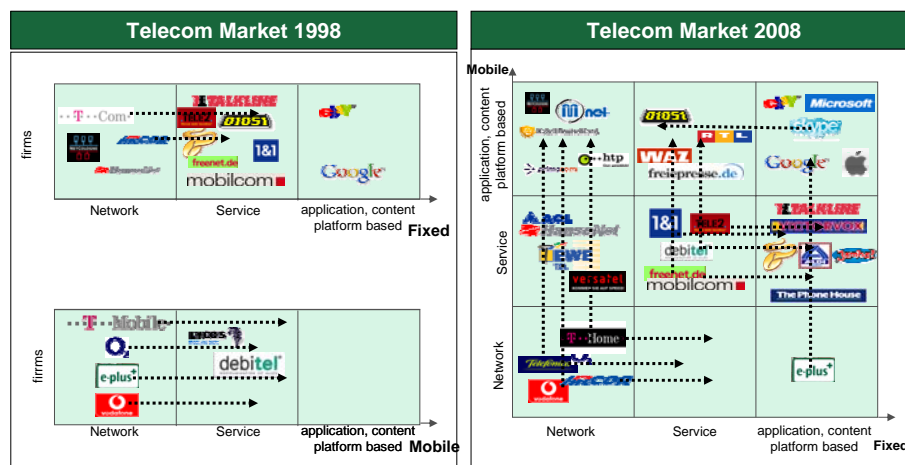
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The changing market environment

Past vs. present market players

10 years ago few network operators dominated fixed and mobile markets separately. Today big firms are increasingly integrate in all market segments of fixed and mobile.



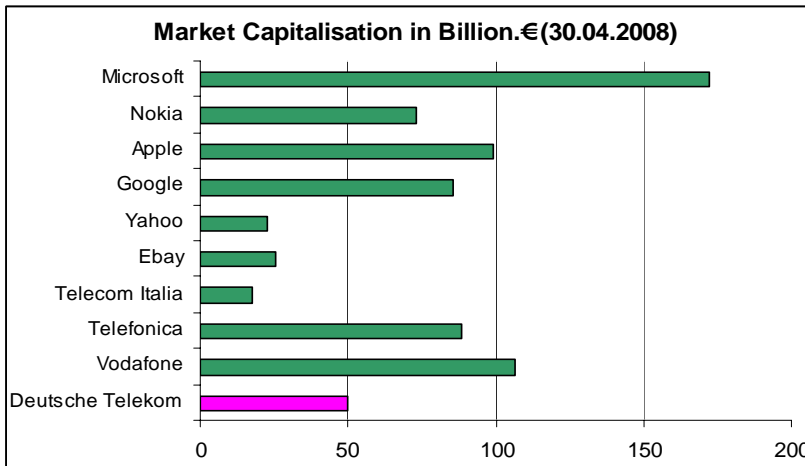
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The changing market environment

The size of market players

In the German communications market several big firms compete with each other. Deutsche Telekom is by far not the largest firm in terms of market capitalization.



Source: Own research, Ovista

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The changing market environment

Shift in revenues

While revenues of the traditional telephony business continue to decline, content-related revenues are expected to become increasingly important .

- While worldwide voice revenues are expected to remain stable at 1.100 Billion US\$, data revenues are predicted to rise from 450 Billion US\$ in 2007 to 640 Billion US\$ in 2011.
- While in Germany total "Fixed Communications Service Revenues" are expected to be 34,4 Billion € in 2008 they are expected to decline to 30,3 Billion € in 2012.
 - Total Voice Service Revenues will go down from 21,1 Billion € to 18,6 Billion €
 - Internet Service Revenue will remain stable at 13,2 Billion €
 - Video/IPTV Revenue will go up from 66 Million € to 330 Million €
- Content-related revenues in the Internet have the highest growth potential
 - Retail-Content revenues in the Internet are expected to grow from 0,3 Billion € in 2008 to 1 Billion € in 2012
 - Advertising revenues in the Internet are expected to grow from 0,7 Billion € in 2008 to 1 Billion € in 2012

Source: Pyramid Research, 2008; Yankee Group, 2007

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3. A new regulatory framework for future communications markets

A new regulatory framework for future communications markets

NGN regulatory challenges

Economic and technological developments on communications markets will drastically change future regulatory challenges.

Erosion of Bottlenecks

Infrastructure competition is already a reality today with a variety of technologies being used. Network bottlenecks will increasingly erode.

- Infrastructure competition is already a reality today with a variety of technologies being used. Network bottlenecks will increasingly erode.
- Mobile services are increasingly becoming substitutes for fixed services, thus encouraging infrastructure competition.

Risky NGN Investment

With NGN investments being huge / risky, future regulatory framework must create sufficient incentives for investments.

- There is little social value of NGN applications
- Like any patent also the new NGN markets may be temporarily protected
- There are many examples for non-competitive (high-end) markets not regulated
- Any regulation of NGN networks will reinforce the digital divide

Changing Market Environment

The communications markets of the future will be characterised by a new level playing field market btw. firms.

- Ten years ago few network operators dominated fixed and mobile markets separately. Today big firms are increasingly integrate in all market segments of fixed and mobile.
- Different from ten years ago Deutsche Telekom is increasingly competing with firms being even larger than the German incumbent.

Regulators must be cautious with premature NGN regulation. There are other, more important regulatory challenges on future communications markets.

A new regulatory framework for future communications markets

Regulatory consequences of changing telecom markets

Characteristics of future telecom markets	Regulatory Consequence
1 On traditional telecom markets bottlenecks have eroded due to network competition between different technology platforms	Dismantling of all regulatory instruments applied to narrowband and broadband network access.
2 After 10 years of liberalised markets there are many established telcos . As a result, more and more market segments become competitive.	When reforming the regulatory regime, unnecessary sector specific regulation has to be replaced by general competition law .
3 With investments in NGN networks being huge and risky , the future regulatory environment must create sufficient incentives for investments.	Light-handed regulatory tools are sufficiently capable of disciplining the remaining market power and ensuring non-discriminatory.
4 Given that the market is better informed than the regulator an objective must be to minimise the risk that the regulator sets the pricing wrong.	Apply light-handed regulatory tools such as accounting separation and price cap regulation in the remaining monopolistic bottleneck areas.
5 Future regulatory rules need to be flexible to deal with unpredictable and rapidly changing market conditions .	No imposition of premature regulation that could inhibit innovation and investment.

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A new regulatory framework for future communications markets

Non-regulation of NGN access

- For the time being NGN operators may be allowed to **freely set the conditions of network access**, yet at **non-discriminatory** terms and provided on an **equivalent basis** to all third parties
 - Opponents may argue that NGN assets are bottlenecks allowing the asset owner to **extract monopoly rents** and **margin squeeze** competitors.
- BUT:**
- NGN operators' **incentives to do so is relatively weak** given that the operators' goal is to promote take-up of next generation access services and rapidly increase traffic on the network.
 - Given that the market is better informed than the regulator an **objective** must be to **minimise the risk** that the regulator sets the pricing wrong.
 - Non-regulation and the possibility to earn monopoly rents is a trade-off to counter the high risk investors are incurring in making investments in NGN infrastructure.
 - Asset owner should be able to **capture this rent**. The question of how much is difficult to answer.

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A new regulatory framework for future communications markets

More Control Points in NGN

New regulatory challenges will result from control Points in NGN. They will to a large extend determine if a firm has Significant Market Power.

Possible Control Points in the future:

Network	Services	Content	User Information
<ul style="list-style-type: none"> ▪ Control of Inter-connect and QoS <ul style="list-style-type: none"> ➔ Determines whether/at which quality service are offered ▪ Control of Routing Tables ▪ Control of network related functions via standards 	<ul style="list-style-type: none"> ▪ Control of service related functions via standards ▪ Interoperability of Transport and Service ▪ Walled Gardens <ul style="list-style-type: none"> ➔ Enable operator to restrict access to content 	<ul style="list-style-type: none"> ▪ Control of Content provided exclusively to selected network/service providers 	<ul style="list-style-type: none"> ▪ Customer Billing Information ▪ Access to customer Information Systems ▪ Control of location based services

These potential bottlenecks may enable operators / providers to exercise market dominance by imposing unfavourable access conditions upon other market players

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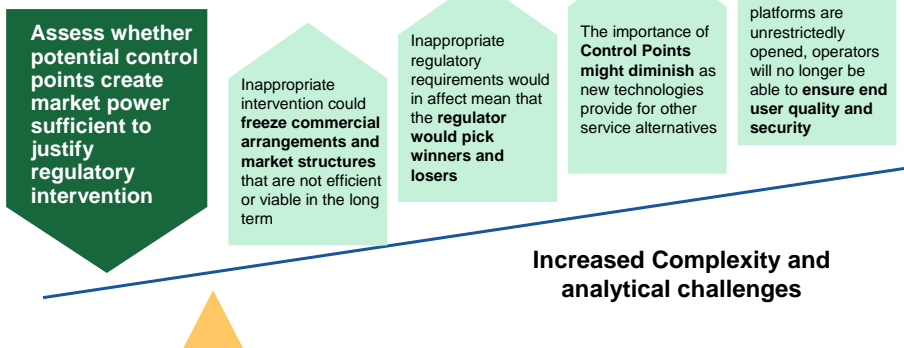


A new regulatory framework for future communications markets

Increased complexity of regulatory interventions

Existence of Control Points might lead to serious barriers to market entry which in turn might call for regulation. A careful review of the situation is however necessary.

Regulatory Task

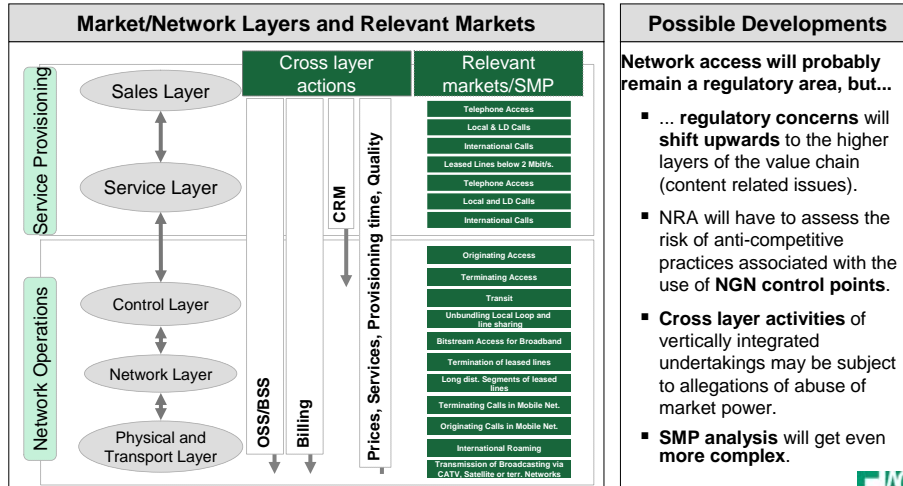


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Status of regulatory discussions regarding NGN interconnection NGN regulatory bottlenecks

In the all-IP world, the regulation of bottlenecks will focus on the control points in NGN. The main question remain how bottlenecks will change with the NGN introduction.



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