

# NGN - Multimedia Implementation of the Legacy Telco Model?

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The opinions expressed in this presentation are the personal views of the author and do not prejudice decisions of the Austrian regulatory authorities.



**“Technology is not kind. It does not wait.  
It does not say please. It slams into  
existing systems. Often destroying them,  
while creating new ones”**

**Joseph Alois Schumpeter (1937)**





**Convergence leads to battlegrounds.**



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- **2nd battleground:** Internet Multimedia <-> NGN Multimedia
- **3rd battleground:** Digital Home

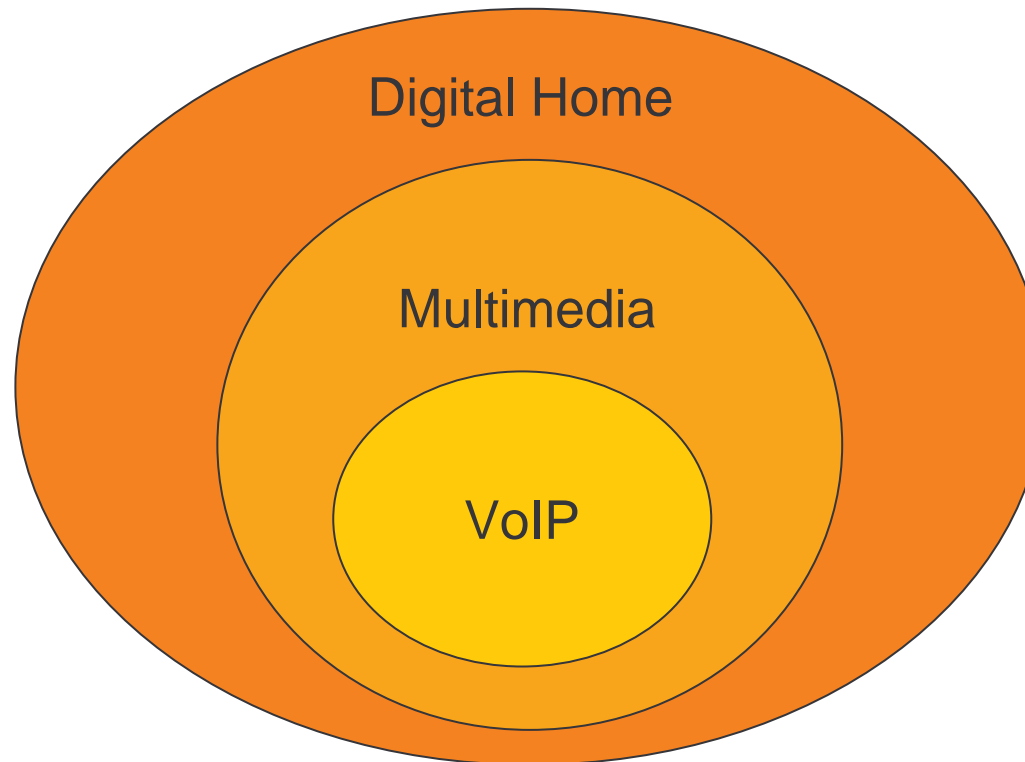


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Multimedia

Digital Home

## The Convergence Battlegrounds





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# 1st battleground: Internet VoIP <-> Legacy Telephony



## Legacy Telco Model – Vertical Integration

- (Voice) transport and telephony service provision are combined in a monolithic block in legacy telephone networks – “vertical integration”.
- As immediate result subscribers connected to legacy telephone networks are only able to subscribe to the service of their network provider – unless alternatives are opened by regulatory intervention in case of SMP (e.g. Call by Call Carrier Selection, Carrier Preselection). The latter demands implementing specific additional technical provisions in the legacy switches.



## Internet Model – What's the Difference?

The fundamental difference to legacy telco networks:

- It's NOT the usage of packets for data transport
- It's NOT the Internet Protocol
- It's the twofold separation of 'transport' from 'service'
  - technically **AND** commercially



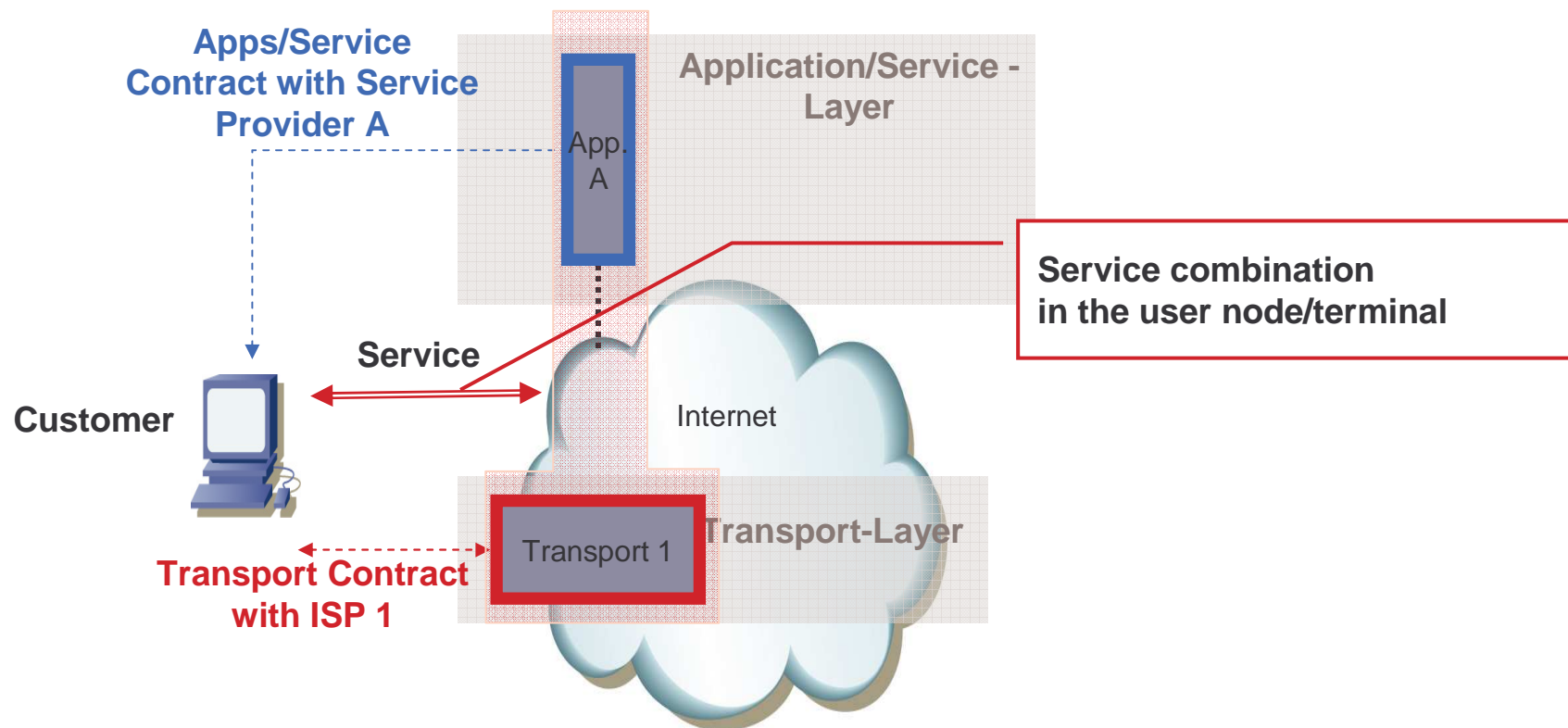


## Internet Model - Services & Applications

- Two basic components:
  - **global Internet connectivity** (bitrate, delay, transfer data volumes,...)  
...provided by the Internet as “dumb” transport network,  
  
AND (from different providers in the generic case)
  - **additional information & service logic** on top  
...provided by intelligent nodes/terminals at the network edge.
  
- The combination of connectivity and additional application/service logic from generally different providers in the users terminal results in functionalities that for the user resemble legacy telco services (e.g. telephony).

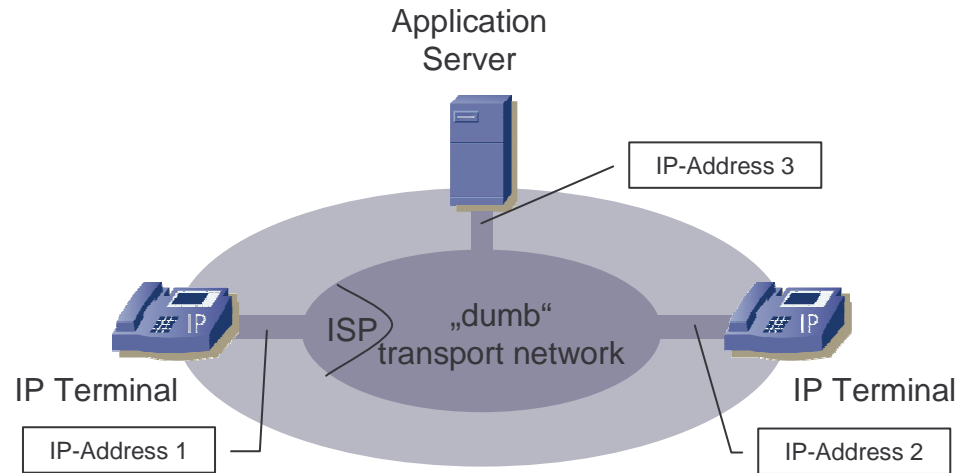


# Internet VoIP – It's Service Combination





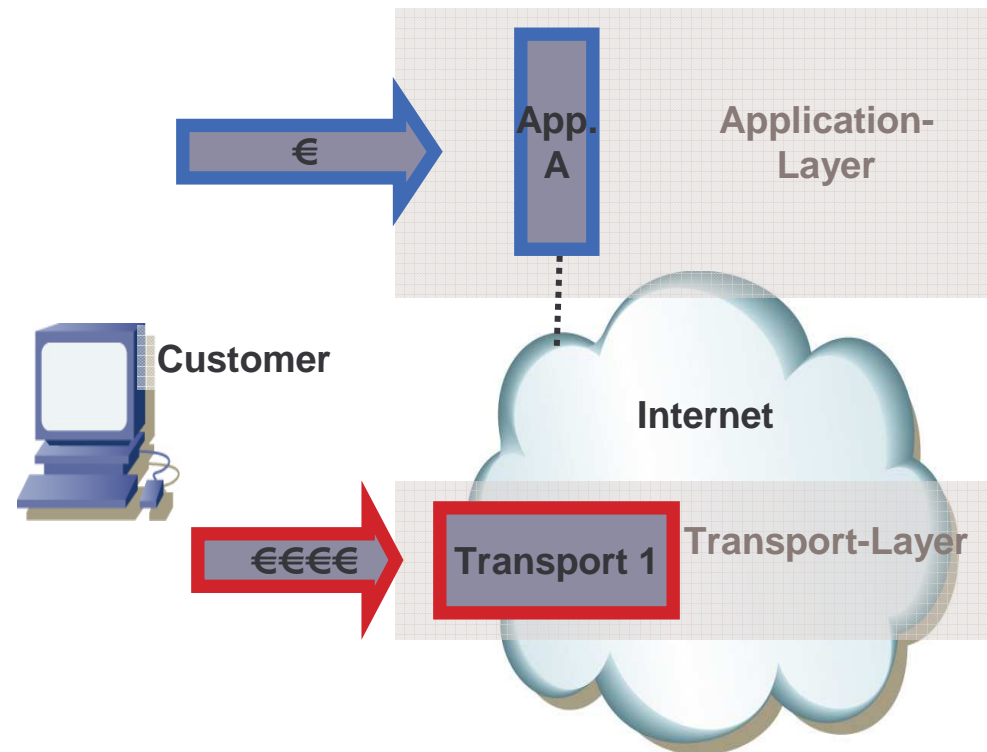
# Internet Only VoIP (simplified)



» Animation



# Internet VoIP – User Payments





## Internet Only VoIP - Service Classification

- The so called 'Internet VoIP provider' does NOT transport any voice packets.
  - Voice packet transport is an independent service provided by the ISP's of user A and user B following requests from the user's terminals.
- ⇒ If someone does NOT transport data, should he then be regulatory treated as communication service provider [by def comm. services consist wholly or mainly in data transport!]?
- ⇒ Only few (any at all?) would classify a street address directory service provider as a road transport company.  
Though obviously the street addresses requested from and provided by the address directory to the customers does enable these customers to transport goods and/or people to correct addresses using independent road transport companies (e.g. taxis, train,...). Only the latter are road transport companies!



## Internet Model – Key Properties

- **Immediate global reach,**  
i.e. any service or application provider anywhere in the world connected to the Internet can offer his services or applications to anyone who is also sufficiently connected to the Internet at any place in the world, without necessity to work out contracts with Internet access providers of these customers.
- A convergent “dumb” transport only platform for all kinds of services and applications.
- Applications & services from the network edge.
- Fosters innovation and competition.
- Leads to a plethora of information & services for end users.
- Also increasing dangers (DoS, Spam, Spits, Worms, Viruses, ... )!



## Barbarians at the Gate ?

- Increasingly views are uttered that Internet based players (e.g. Google, yahoo, MSN, ebay, Skype,...) are “barbarians” and in some way it is suggested that their business model is “unfair” and based on some kind of “arbitrage”.
- Nevertheless it is a fact that the used ISP’s (service neutral) Internet transport service is fully paid by the users – so what’s basically wrong with such a model?
- Anyway this Internet model in many respects is favourable for the users leading to a plenitude of affordable services.



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## 2nd battleground: Internet multimedia <-> NGN multimedia





## Definition of NGN

ITU-T  
Rec.  
Y.2001  
(12/2004)

**Next Generation Network (NGN):**  
a **packet-based** network able to provide telecommunication services and able to make **use of multiple broadband, QoS-enabled** transport technologies and in which **service-related functions** are **independent** from underlying **transport-related technologies**.

It enables **unfettered access** for users to networks and to competing service providers and/or services of their choice. It supports **generalized mobility** which will allow **consistent and ubiquitous provision of services to users**.

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# Next Generation Network (NGN)



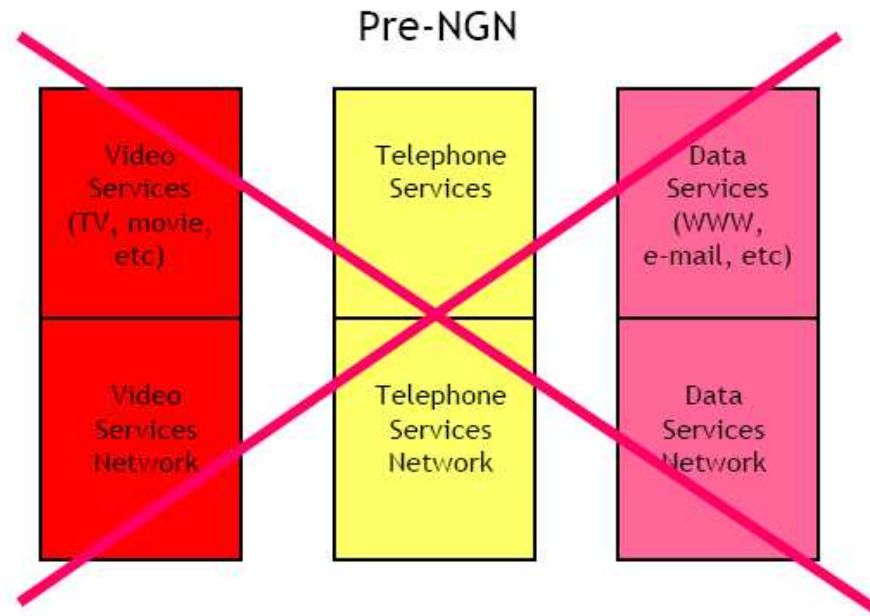
- 1. ... service-related functions are independent from underlying transport-related technologies.**
2. ...unfettered access for users to ... competing service providers and/or services of their choice.



### Trends for Next Generation



## What's Old: Vertically-Integrated Networks



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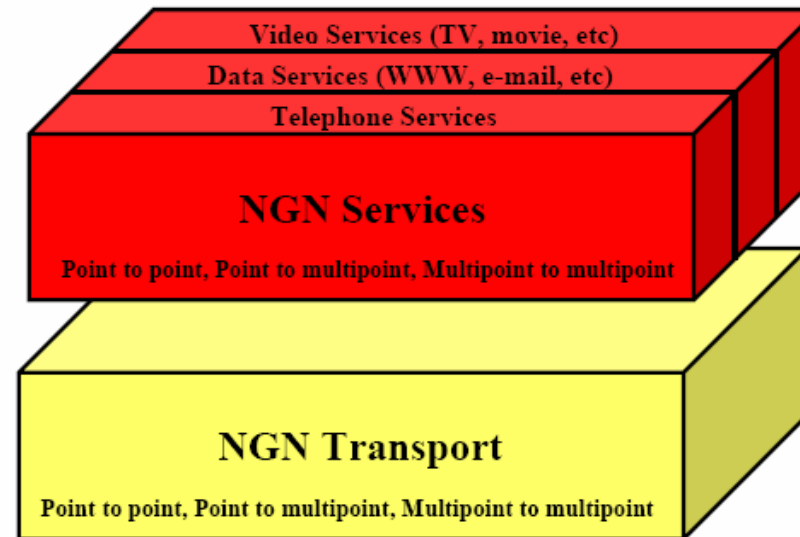
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### Trends for Next Generation



## What's New: Horizontally-integrated Network



ITU-T Recommendation Y.2011

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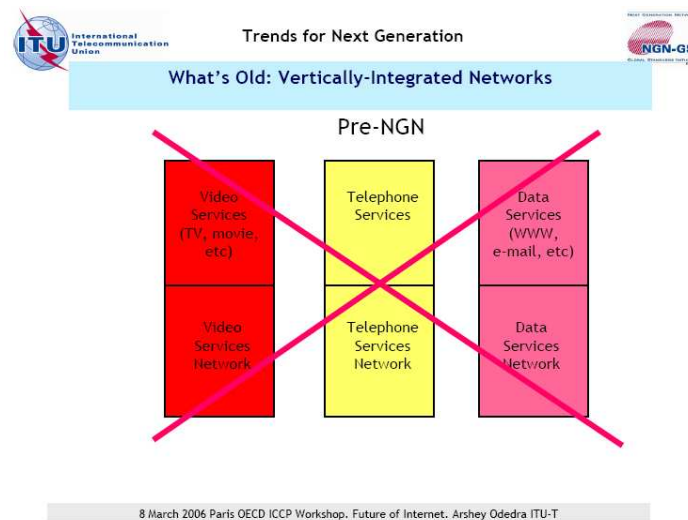
Digital Home

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**Agreed in general – but ...**



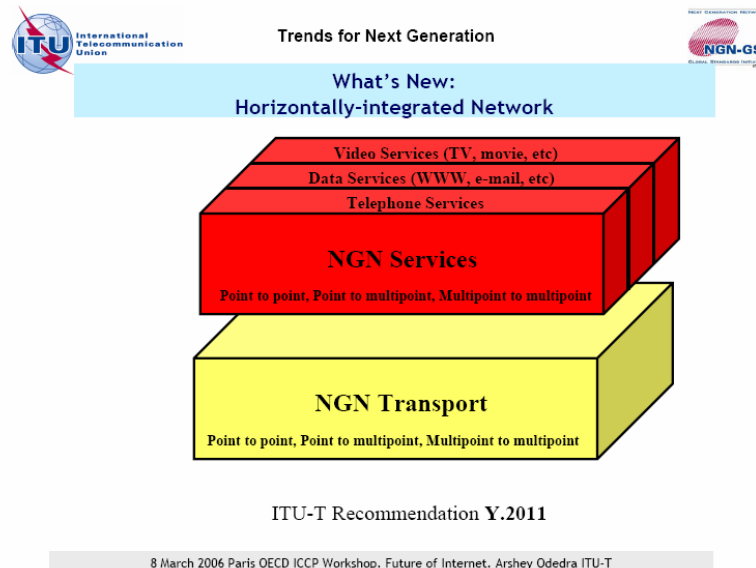
## ... Internet is more than a data services network



- The data services pile in the picture (www, email,...) references the Internet.
- Internet already today is a service neutral transport platform for multimedia services.



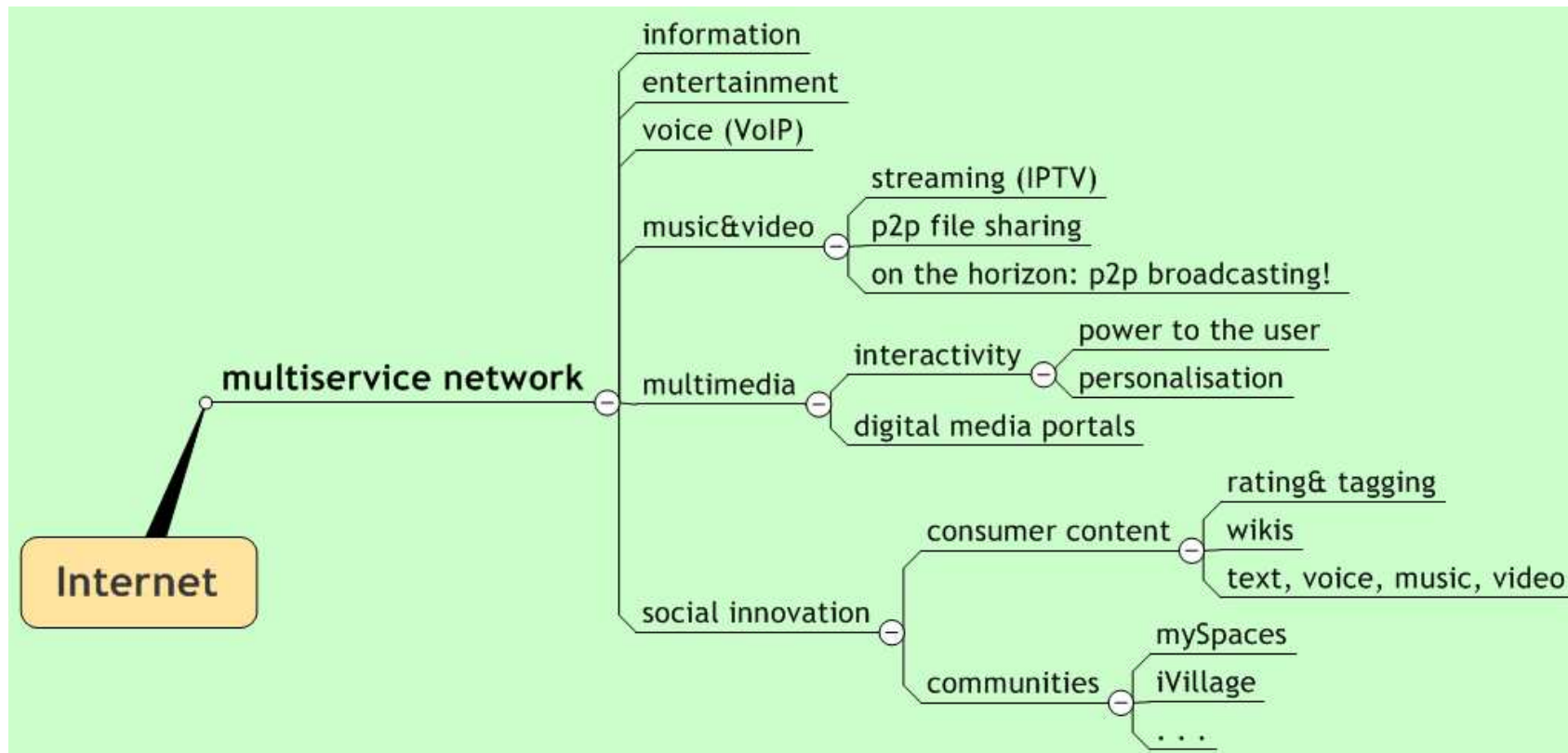
# Internet separates transport from services



- The separation of service from transport is the most important Internet Paradigm – this separation is implemented technically AND commercially!
- Internet services are provided at the edge of the network (“edge centric approach”) – client/server or peer to peer models.



# Internet is today's multiservice network







## Next Generation Network (NGN)



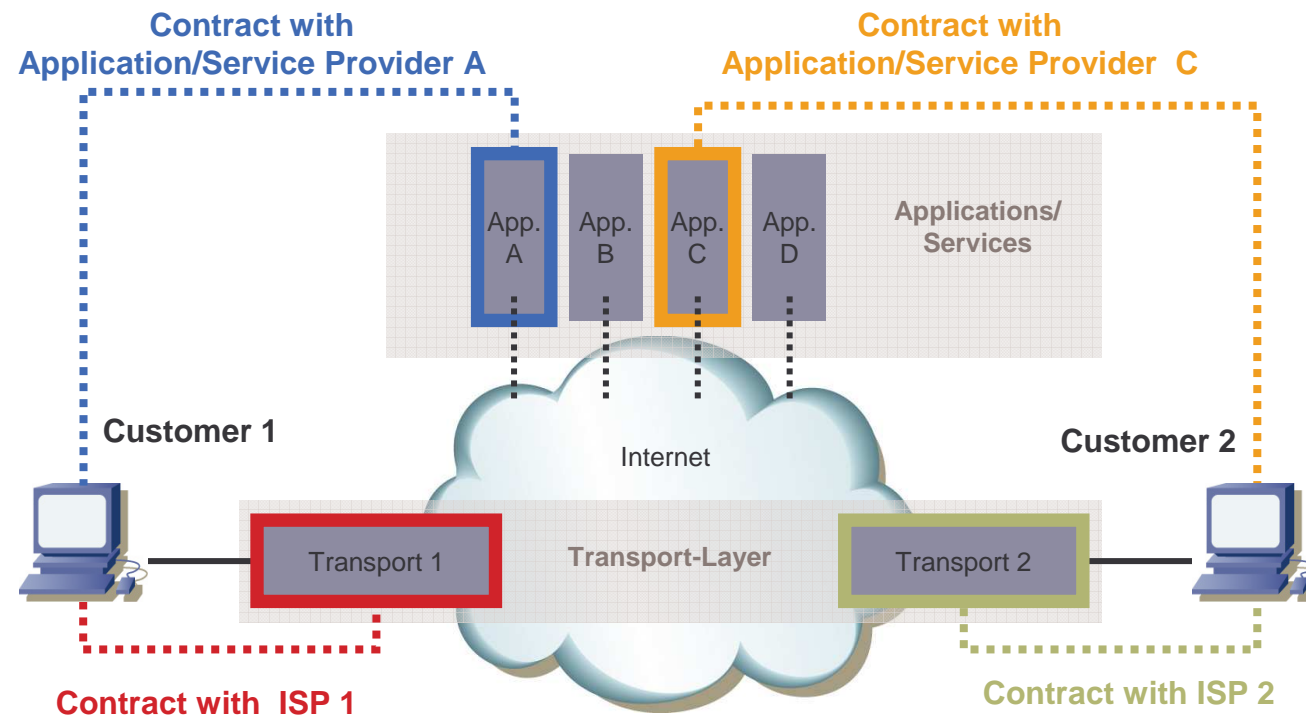
1. ... service-related functions are independent from underlying transport-related technologies.

**2. ...unfettered access for users to ... competing service providers and/or services of their choice.**

**→ Operators NGNs seem to develop differently**



# Internet-Services: It's the users choice



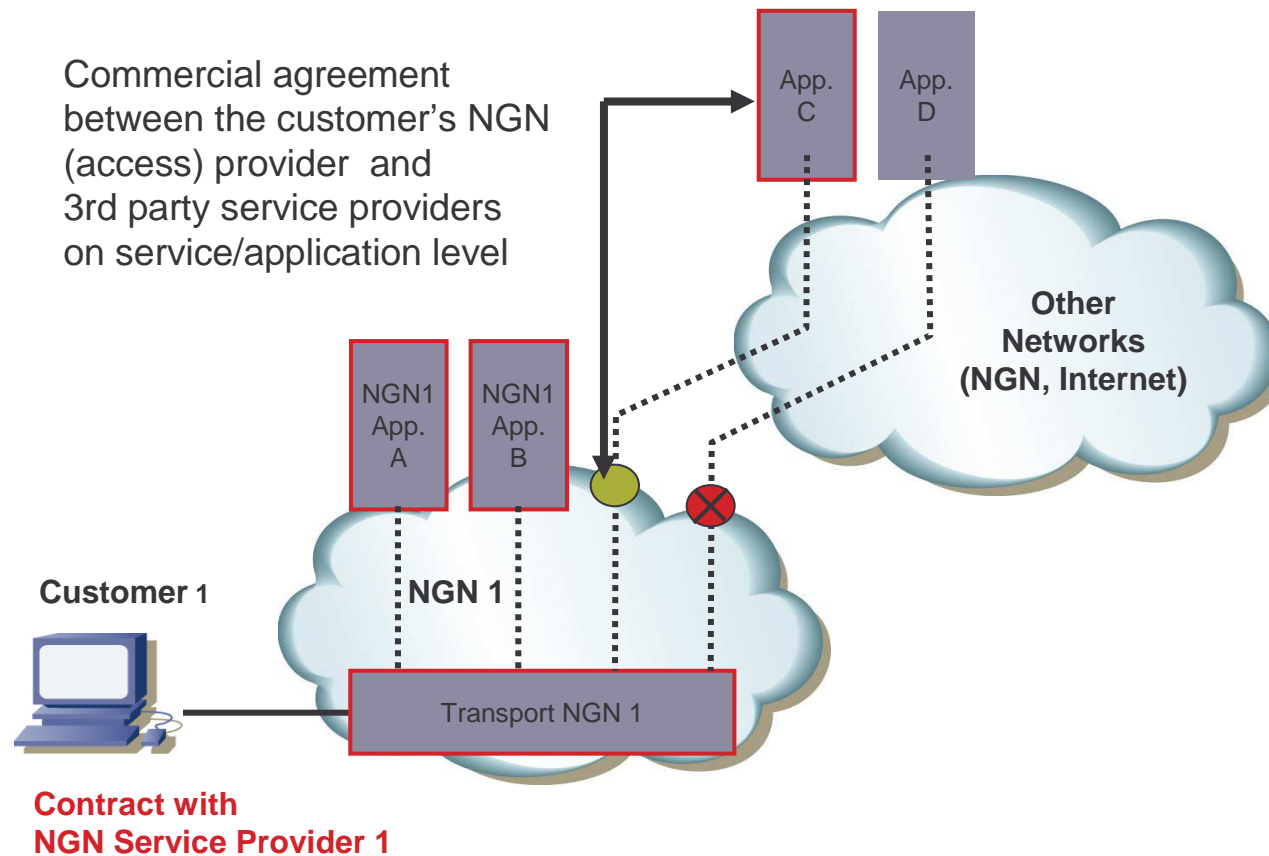


## NGN-Services: Restricted User's Choice (1)

- Similar to legacy telco networks **services and transport are commercially vertically integrated**.
- The customer again might be in a „lock in“ situation as in vertical integrated legacy telephone networks.
- E.g. access to other IP-based voice providers only with consent of (access) NGN provider of respective subscriber possible – or regulatory enforcement?



# NGN-Services: Restricted Users Choice (2)





## Internet & NGN –Technical View

- **Both** Internet and NGN are built on **technical separation of transport from application/service**.  
This is facilitated by the use of IP based technology and accordingly layered architecture.
- A **major technical difference** is the handling of application/service provision. In the Internet it is implemented at the **network edge nodes/terminals** (“dumb network”). In **NGNs** it is implemented as a **specific layer of the network** (“network centric approach”).



## Internet Model - Interoperability

- Dumb „transport only“ network.
- Clients must fit to service implementation at the server (or peers in case of peer to peer services).
- Easy provision of global services without necessity of technical or commercial coordination/contract.
- Differing service implementations of different service providers lead to service islands (IM, VoIP).
- Improving interoperability between island depending on market forces (only service providers have to agree on common solution, transport networks are not involved).



## NGN Model - Interoperability

- Feature rich („smart“) NGNs.
  - (Many) services are provided in a commercially vertically integrated manner by the NGNs.
  - Intense service specific interworking requirements at the network borders are the probable results.
  - Available experience for “telephony only” networks: still in our days there are sometimes CCS#7 interworking problems when first time interconnection two telephone networks.
- For global interoperability of a single service all involved intermediate NGNs must implement interoperable versions of the specific service.
- **Can we be optimistic regarding global NGN interoperability when looking at the multitude of envisaged NGN multimedia services ?**



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**What then might be  
key features really in favour of NGNs?**





# NGN Model – Features Beyond Internet



## NGN Architectures



### Key Concepts for NGN Architecture

- Separation between service and transport
- Personal and Terminal Mobility
- Resource and admission control → **security**
- QoS selection & control → **end to end QoS**
- Accommodation of legacy terminals and systems

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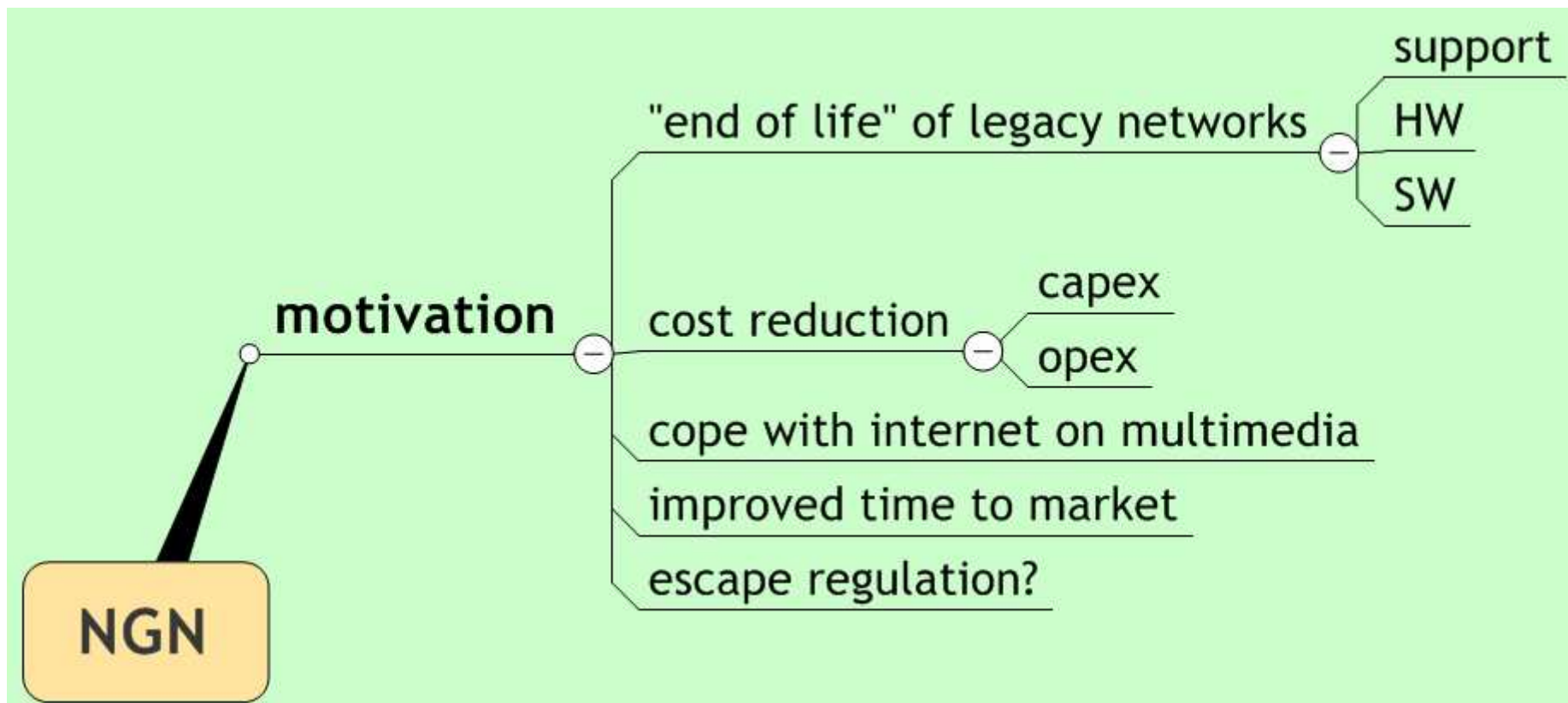


## NGNs – Security and QoS

- Security and QoS are undoubtedly very important features.
- Improvements to some extent also possible in the Internet (e.g. authenticated access).
- It will to be seen if increased NGN complexity will pay back.



# Motivations for telcos migration to NGN





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## 3rd battleground: Digital Home



## The final showdown

- Industry convergence
  - digital media, broadcasting, entertainment, home control, communication.
- New big players & new alliances.
- Increasing technical complexity.
- Decisive battle between Internet and NGN will be decided in the context of digital home infrastructure and services.



## Net Neutrality

- Big telcos (e.g. in US) increasingly talk about QoS fees to be charged on Internet only players (yahoo, ebay, ...).
- Telcos in many countries control increasing parts of broadband access.
- Some politicians seem to extremely favour broadband penetration at cost of other goods.
- (Unrestricted) Internet Connectivity as a NGN service?
- There might be a point in time - not so far away - when politics will have to make clear what they treat as priority.
- Regulators should be prepared for escalation of this topic!



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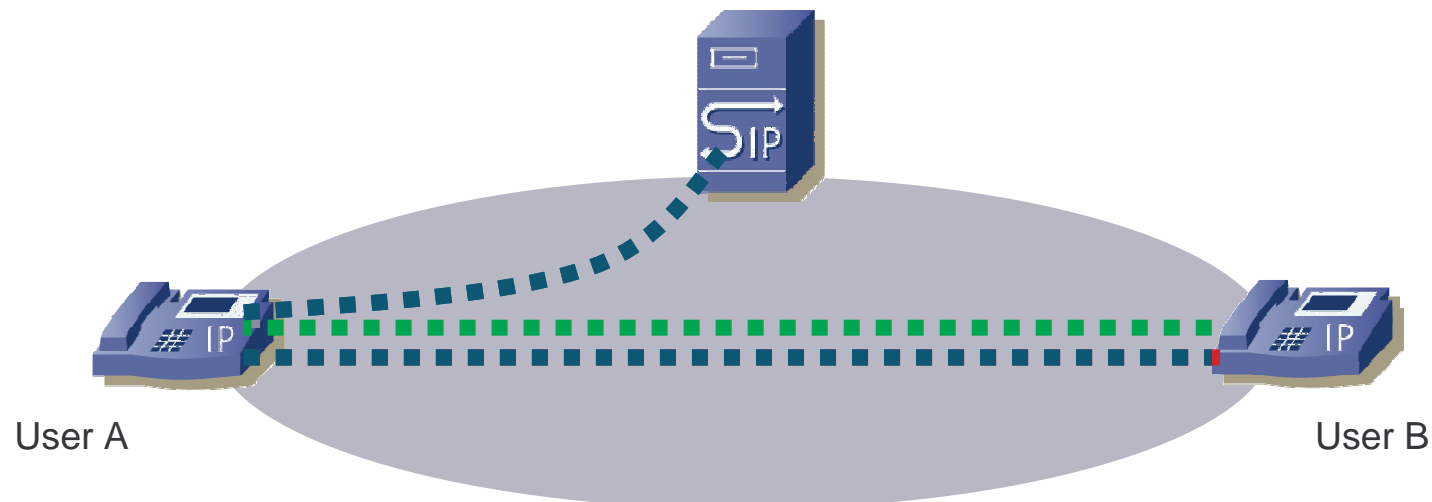
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Thank you very much for your attention!



## Internet Only VoIP (simplified)

1. Where is user B?
2. Voice connection
3. Connection end



» back