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# ***IMS vs. Peer-to-Peer – a War of Concepts or a Synergy?***

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# *Overview*

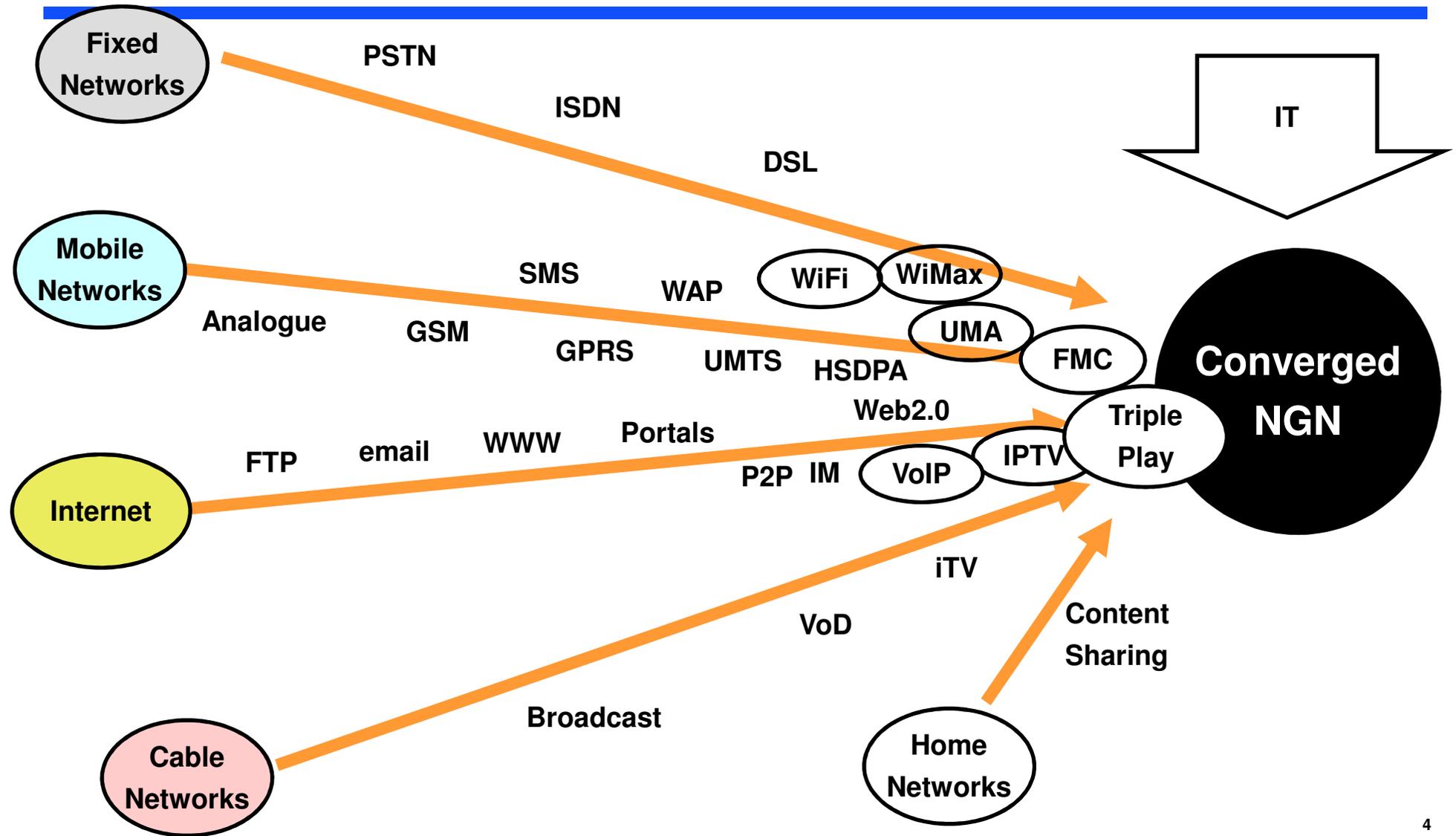
- **Motivation: The value shift from Networks to Services**
- **Multimedia services à la Telecoms: IP Multimedia System (IMS)**
- **Multimedia services à la Internet: Peer2Peer (P2P)**
- **IMS vs. P2P – Conflict or Synergy**
- **Integrating IMS and P2P**
- **The FOKUS Open IMS Playground and the way forward to integrate P2P**
- **Summary**

# ***Motivation***

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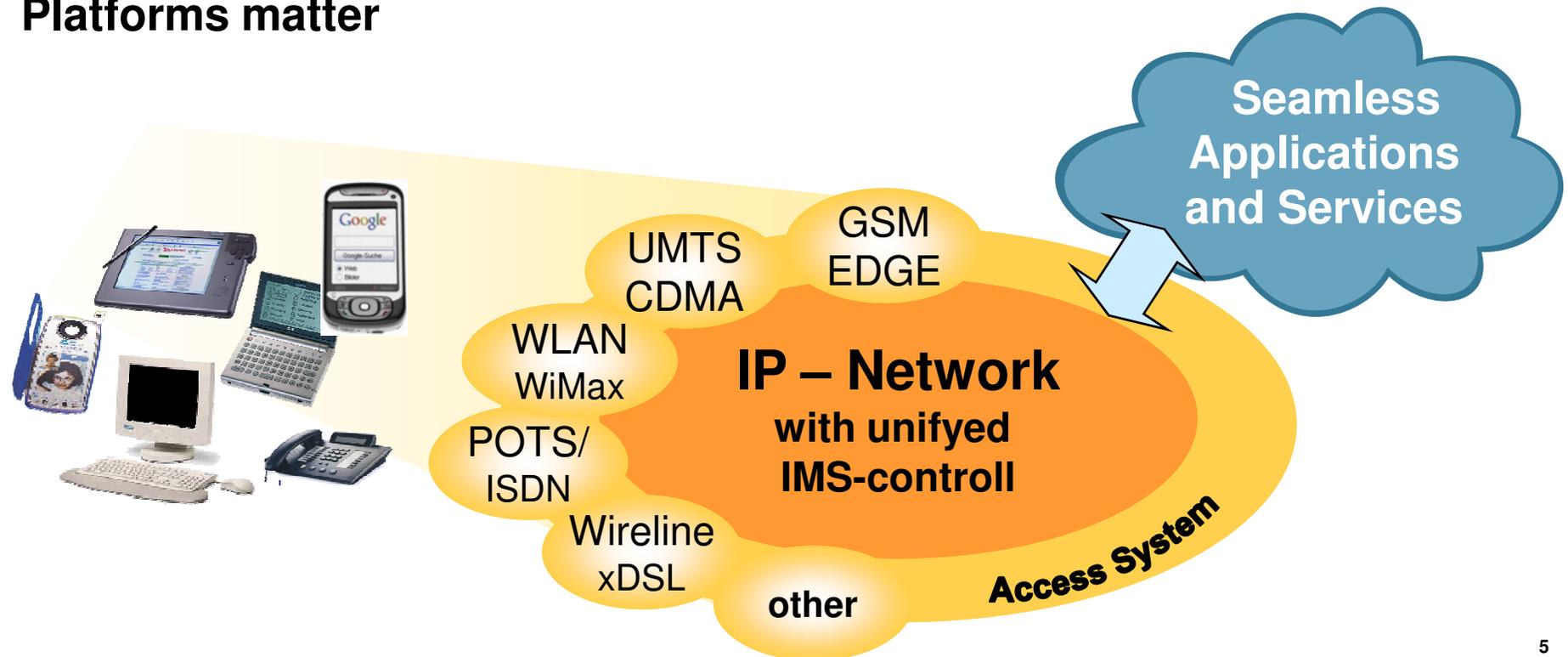
- **Multimedia Services are driven by the Convergence of Networks by means of IP**
- **The value of networks and pure communication services decreases, communities and content services gain momentum empowered by the Web 2.0**
- **IMS is the telco response to evolve the networks towards a controlled internet service environment**
- **P2P represents within the internet the state of the art technology for scalable communication and content sharing / distribution services**
- **So far P2P has hurt industries (Napster, Skype, what about Joost?)**
- **Often IMS is contrasted to P2P (telco vs. Internet), but both are overlays → shifting the focus from the network towards services**
- **IMS and P2P could be combined (for reliability and scalability)**
- **Advice: Network Operators transforming to network and service companies should consider P2P and start prototyping in testbeds**

# Evolution towards Converged Networks



# Seamless Services – The Network doesn't Matter

- Network diversity and network innovation pace has lead to network abstraction based on IP as common denominator
- Connectivity Services versus Multimedia Services
- Users are interested in services – thus End Systems and Service Platforms matter

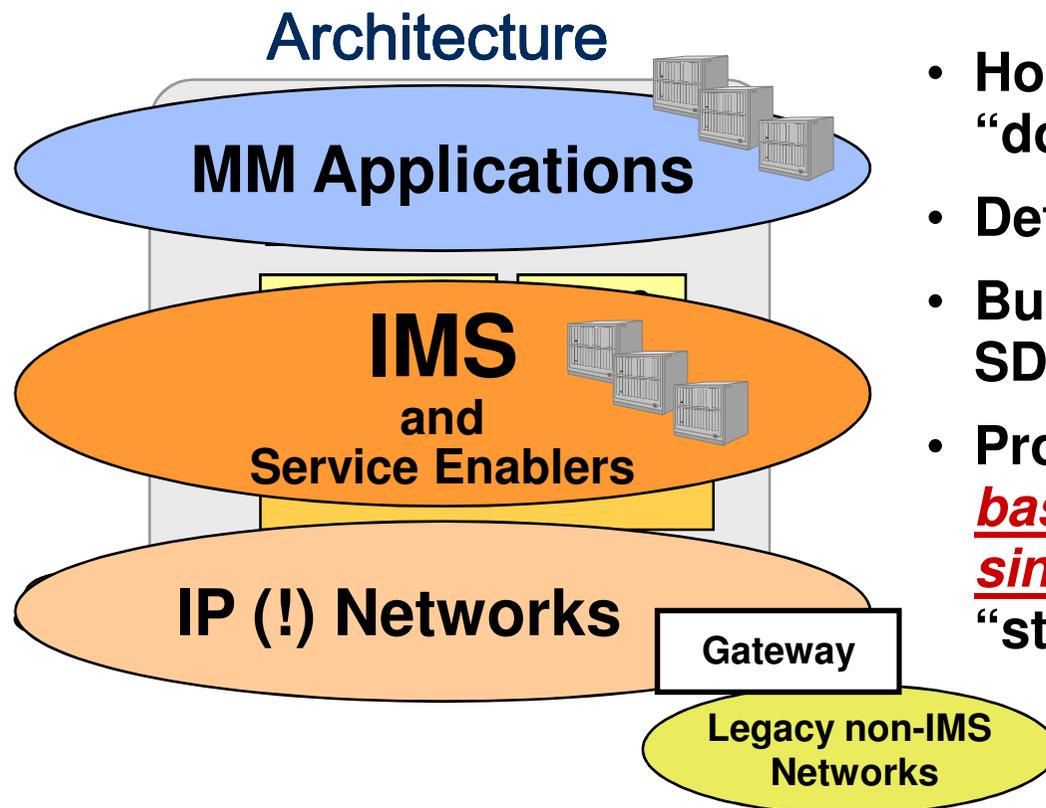


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# IMS Architecture Principles

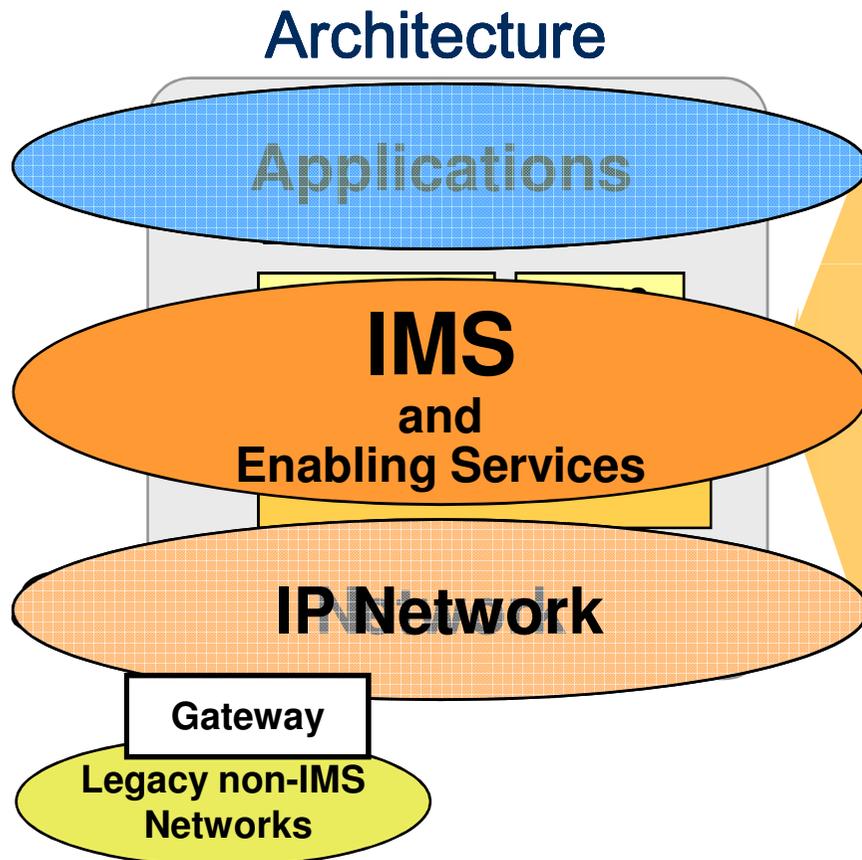
- IMS does NOT standardise specific services, but enablers
- BUT supports inherently multimedia over IP, VoIP, IM, presence (SIP)
- IMS enables the flexibility in providing IP-based applications !!



- Horizontal Architecture defining a “docking station” for applications
- Defines service enabler capabilities
- Builds on existing IETF and telco SDP standards
- Provides better security, Service based QoS, flexible charging and single sign on compared to the “standard” open internet

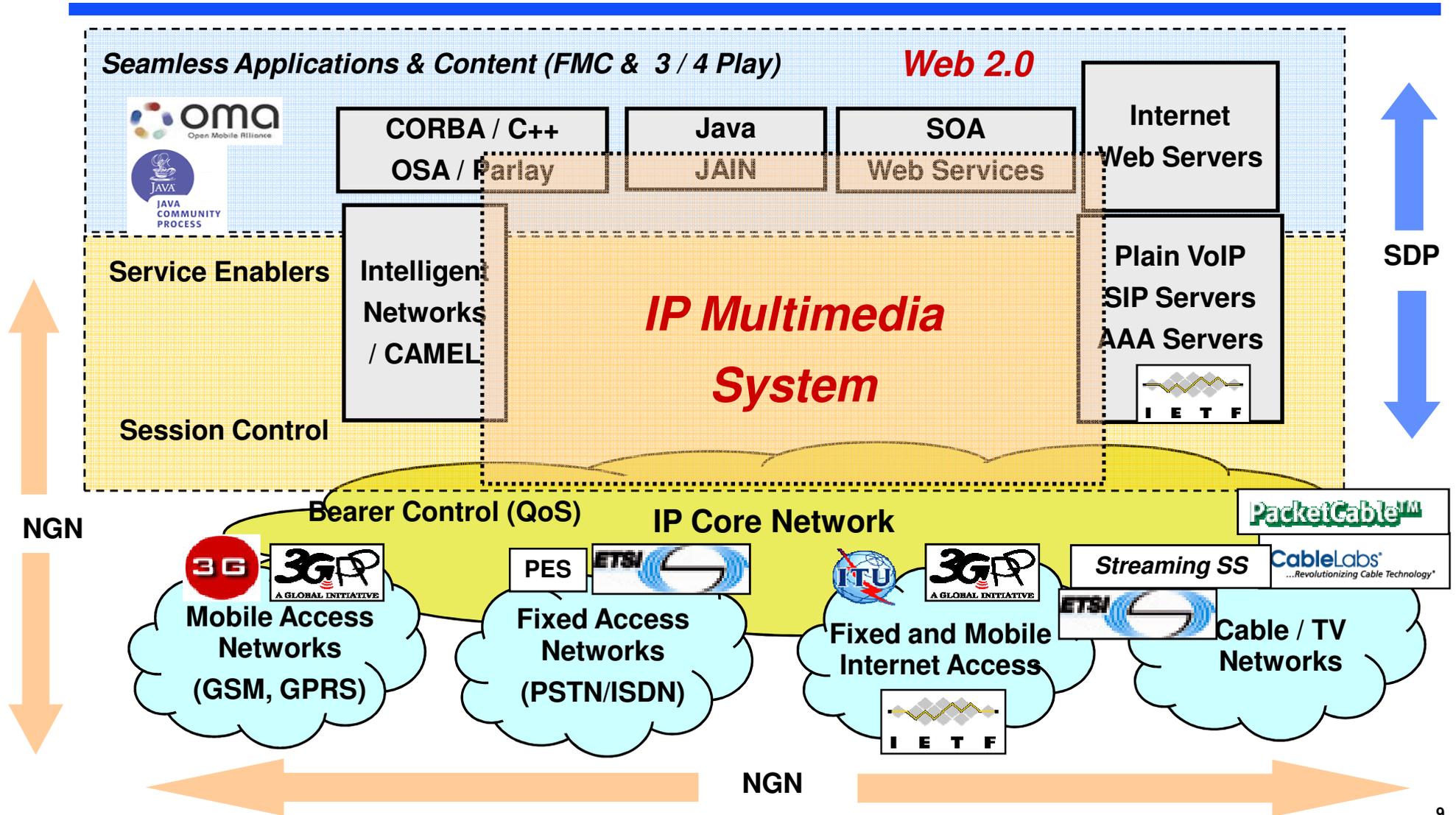
# IMS Core Infrastructure Functionality

- Implementing generic functionality in the infrastructure is most economical !!



- Multiparty / Multimedia Session handling based on SIP Control
- Multimedia Content Pull & Push
- Messaging Support
- Conferencing and Group Com. Support
- Fixed Mobile Convergence / 3P
- Single-Sign-On User-Authentication
- High Secure Service Access and Provision
- Service based Bearer QoS
- Flexible Charging
- Legacy Network Interworking Support
- *Docking Station for Service Enablers*
- *Docking Station for Applications*

# IMS is a global Standards for Converging Networks



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# What is P2P ?

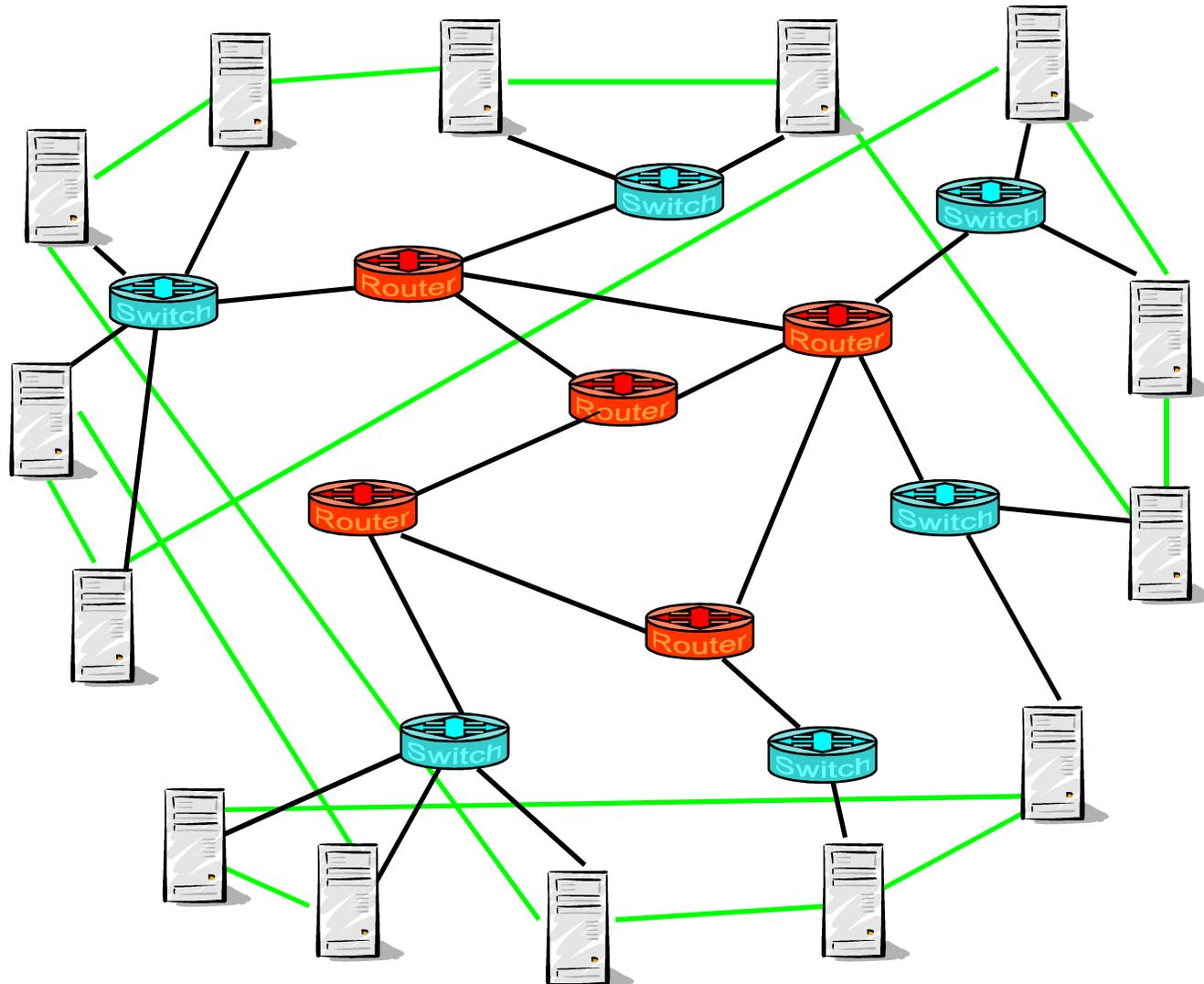
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## P2P Definition:

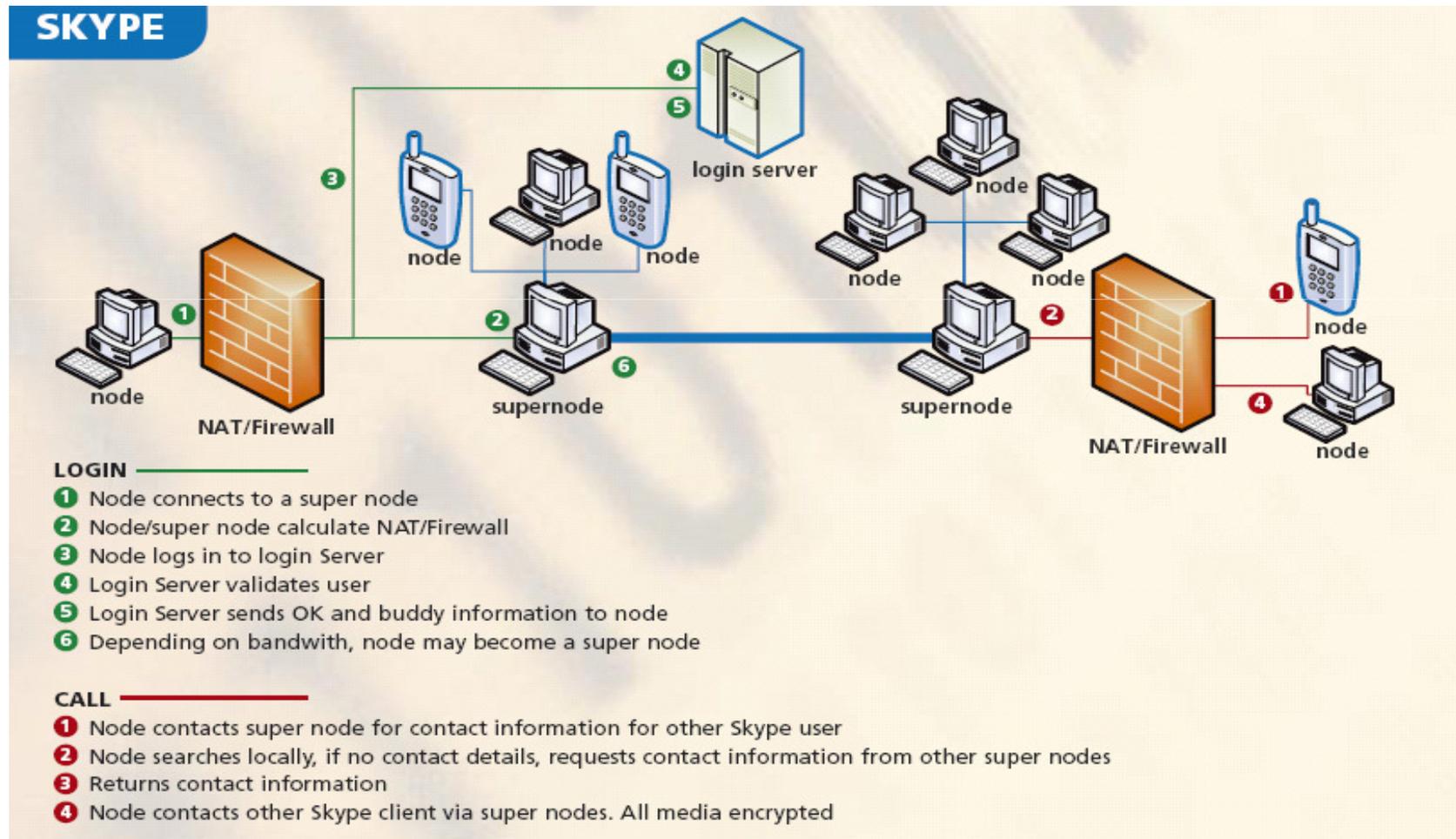
- **Network of systems with autonomy from one, ore multiple central servers.**
- **Utilization of resources in every peer, mostly end user systems at the edge of the internet. Resources can be, but are not limited to:**
  - **Content (Storage)**
  - **CPU Power**
  - **human interaction (Presence, Voice, Video, IM)**
- **Resources can appear and disappear randomly, due to non-permanent network connectivity or user behavior**

# P2P Basics: Overlays

Physical Link  
Overlay Link

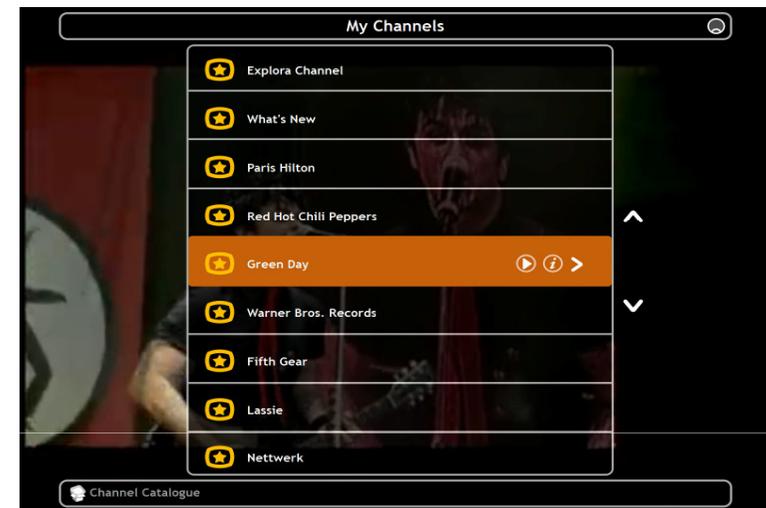


# P2P in Reality: Skype



# Learn from the Internet: From Skype to Joost™

- Peer-2-peer based Internet TV for free
  - financed by advertising within content streams
  - beta test stage
  - See: [www.joost.com](http://www.joost.com)
- merging of TV service and internet services (already provided by Skype)
  - communication/messaging between consumers while watching TV
- available for Windows and MacOS X (Intel hardware only); Linux in development
- developed by the founders of Kazaa and Skype



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# Comparing the Pros and Cons

	P2P	IMS
Scalability	very good	difficult
Single Points of Failure	No	Yes
User Acceptance	good	bad
Users as Providers	Yes	No
DDoS vulnerable	No	Yes
Access	Easy	Difficult
Security	bad	good
AAA	No	Yes
Administration	Hard	Easy
Quality of Service	No	Yes
Billing / Charging	No	Yes
Service Deployment	Difficult	Easy

# Lessons Learned

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- **P2P serves the aspect of a scalable content delivery system and is widely accepted. Content is available from many sources, but no Security, QoS, AAA or Administration applies. Due to its distributed nature, P2P networks have proven to be resistant against DDoS attacks.**
- **IMS provides all the administrative functionalities which are required to deploy commercial services. Scalability is an issue, depending on which component in the (very complex) IMS is to be scaled up. Especially, certain IMS components can be easily overloaded by a DDoS attack.**

***→ So what is needed ? Integration !***

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# ***IMS/P2P Benefits***

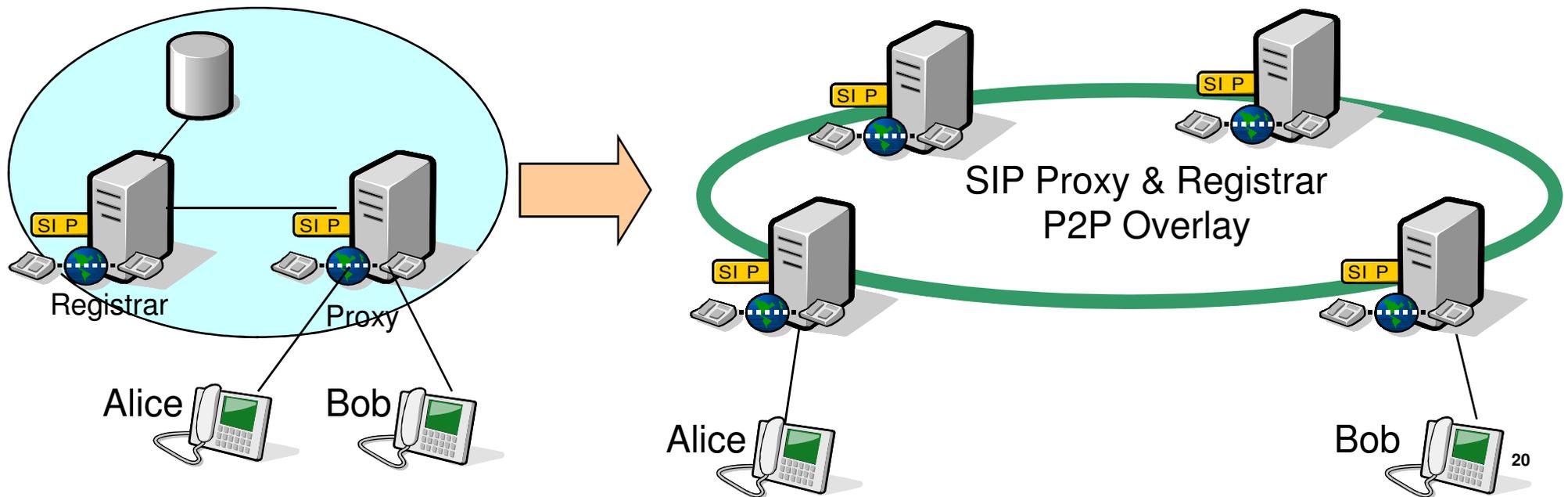
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- **IMS/P2P expected benefits:**
  - **IMS/P2P Operator**
    - **Clients contribute to IMS platform e.g. for content distribution (c.f. Bertelsmann (GNAB), Peer Impact)**
    - **Self-scaling content distribution (e.g. using Bit torrent)**
    - **Reduced administrative overhead through P2P based self-management**
    - **Optimized network resource usage**
      - **(end-to-end vs. end-to-core-to-end communication)**
  - **Consumer**
    - **Bonus models for IMS/P2P contributions possible**
    - **Increased service bouquet (users contribute to service platform)**
    - **Increased quality of experience**

# Integrating P2P + IMS = P2P based IMS

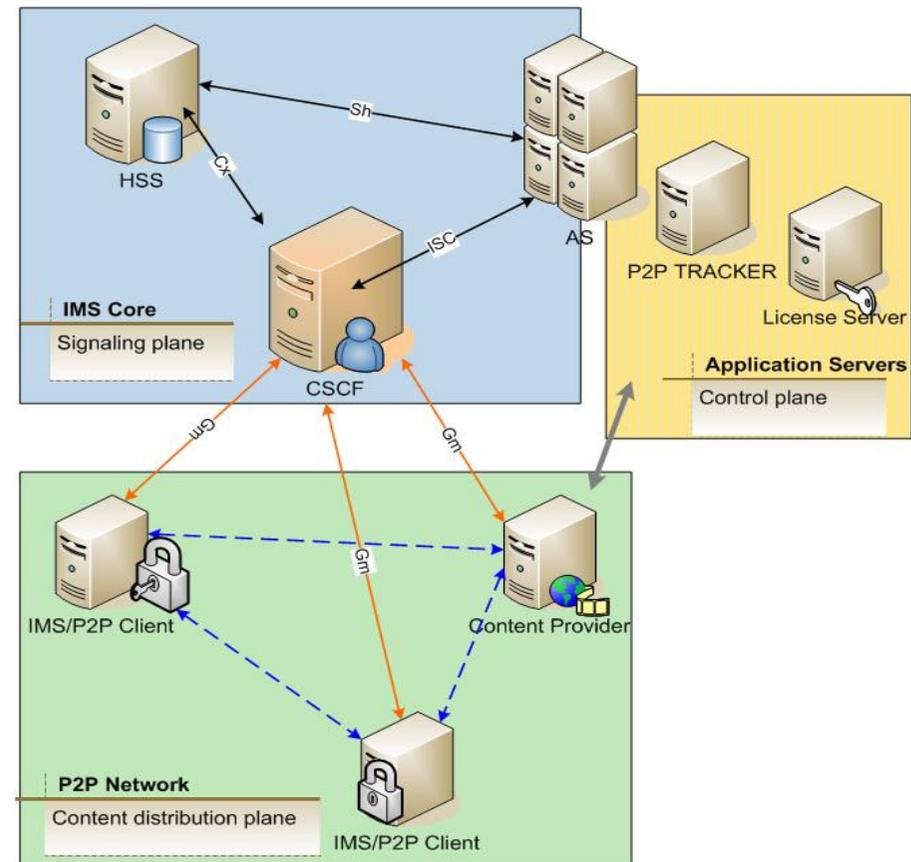
## P2P Technology for scalable server architectures

- Eliminating single point of failure (load balancer)
- Adaptive load balancing by Dynamic P2P among servers.
- Private, managed P2P intranet



# The way forward: Integration of IMS and P2P

- **Self-scaling content distribution using P2P**  
e.g. BitTorrent
  - Not relying exclusively on central media servers
  - Ease of content publishing
- **Adding centralized DRM servers**
  - Encrypted content only available for authorized users
  - Content distribution independent from license management allowing free distribution of information without risking revenue collection
- **Powered by IMS**
  - Flexibility of different charging schemes (e.g. subscription model, pay-per-download...)
  - Trusted public user identities within the network
  - Services available from other networks using Public Service Identities (PSIs)



## ***Towards a Telcom P2P Client ...***

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- **Network operators have to start thinking without owning and operating a network**
- **This thinking would enable them to go beyond their current network boundaries and customer base and beat the enemies with the same technologies**
- **Having a strong Telcom brand would enable operators to get their software to the end users providing a trust worthy software**
- **The services supported by that software client could feature integrated communication capabilities with legacy integration (PSTN interworking, SMS interworking, payment, presence, etc.)**
- **White labeling of the software client could be used as a toolkit for service and content providers lacking the software skills but having specific content and/or specific customer segment access allowing to implement a Win-Win strategy**

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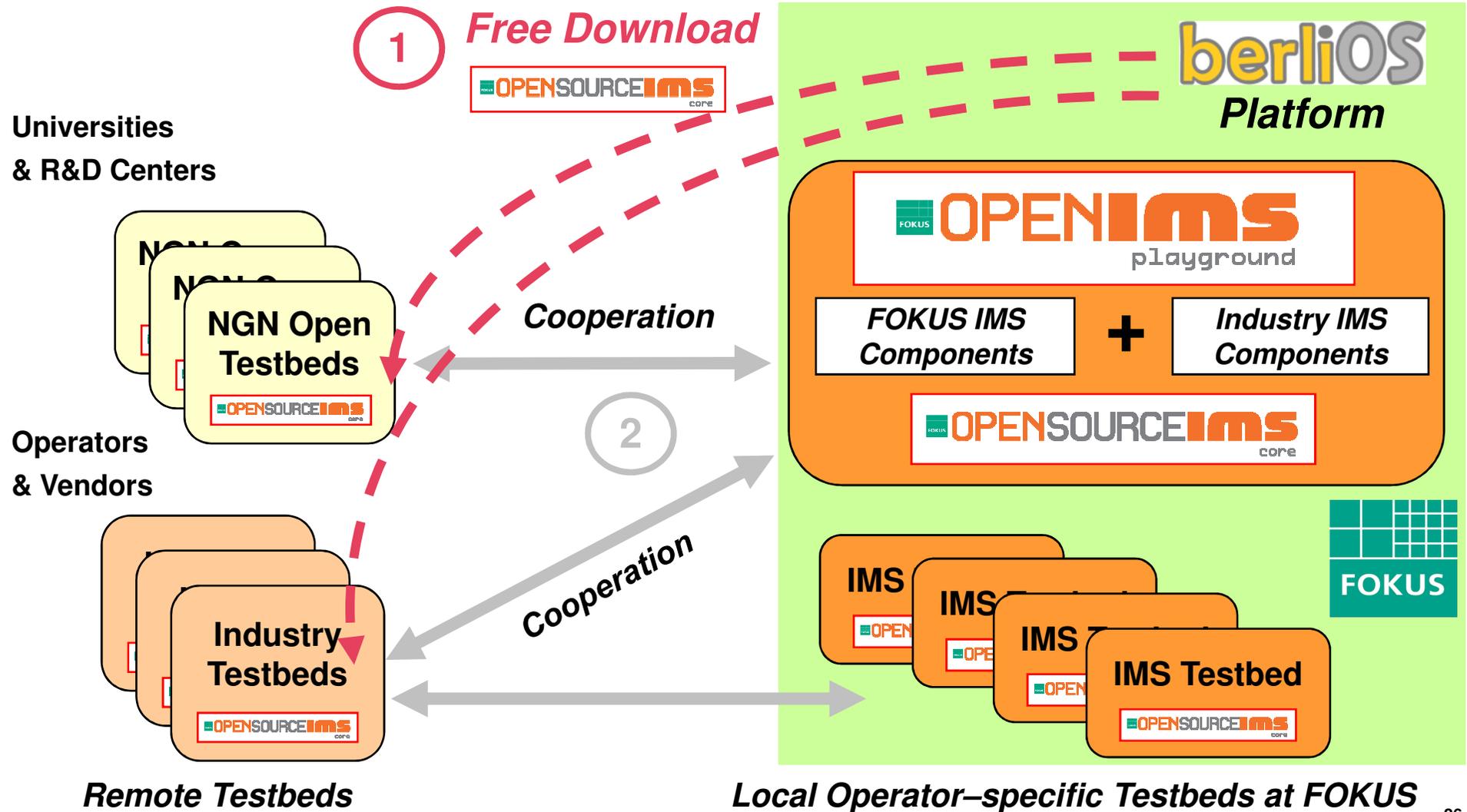
# ***IMS Testbeds as R&D Base @ FOKUS***

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- **In November 2004 – after 2 years of development sponsored by BMBF and FOKUS – the FOKUS Open IMS Playground has been officially opened**
  - **[www.open-ims.org](http://www.open-ims.org)**
  - **Technical foundation was the expertise and available software in the fields of Open Source SIP Express Router (SER) und FOKUS OSA/Parlay Gateway (OCS)**
  - **The Open IMS Playground is the globally pioneering open IMS Testbed und contains FOKUS own developed and industry partner IMS products**
- **In November 2006 the FOKUS Open Source IMS (OSIMS) Core System - the core of the IMS playground - has been officially released to the general public via the BerliOS Download site**
  - **[www.openimscore.org](http://www.openimscore.org)**
  - **OSIMS allows industry and academic institutions to setup own testbeds (with or without FOKUS support and components)**
  - **Since then OSIMS has been downloaded many thousand times from all over the world**

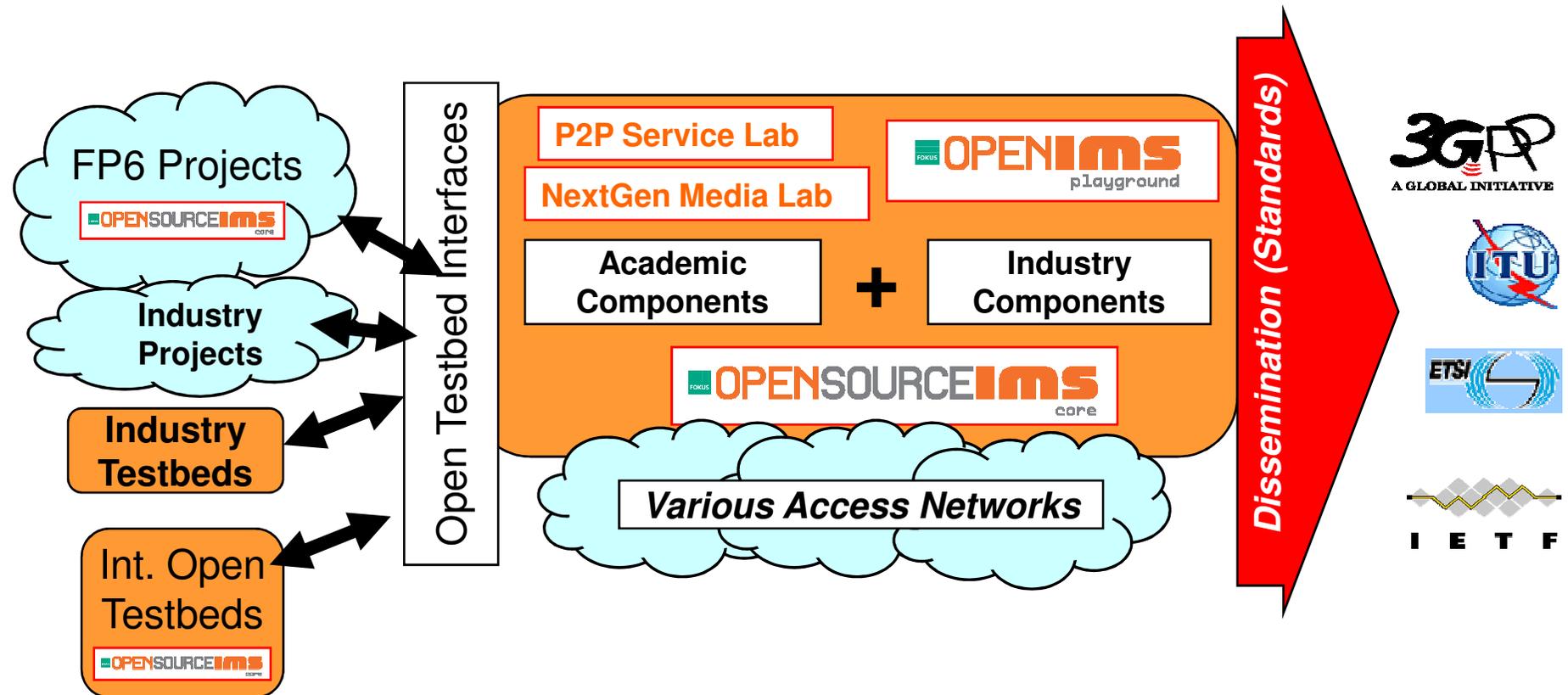


# FOKUS Open IMS Playground Concept



# FOKUS NGN Services Testbed

Academic and Industry R&D Projects for Applications and Service Platforms  
(Proofs of Concept Validation, Interworking, Benchmarking, etc.)



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- **Open nature of the internet pushes innovation**
  - **The internet is providing multimedia services and IPTV TODAY!**
- **Functionality, low usage costs (free of charge) and ease of use create „killer applications“**
- **Network operators have to revise their business models and technologies for an IP-based multimedia services world:**
  - **Separation of network and service business**
  - **Go for white labeling and partnering with strong established brands**
  - **Compensate lower end user revenues by revenues from advertisements**
  - **Exploitation of the P2P ideas is promising**
    - **Integrate IMS and P2P for scalability, reliability and content provision**
    - **Create telco branded P2P clients**
- **Advise: Start with the IMS toolkit from FOKUS ;-)**



**Any Questions?**