



International Telecommunication Union

**NGN Technology & Systems
Development Trends
Convergence & Competition**

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Dar es Salaam, 3-5 October 2006



Telecommunications Industry Trends

1

**CONVERGENCE
AND IP-BASED
NETWORKS**



**Internet Protocol-Based Platform;
Multiple Access Networks; Security**



2

**TECHNOLOGY
AND
APPLICATION
INNOVATION**



**R&D, Miniaturization, Greater
Spectrum Efficiency, Applications
(Home, Office, Mobile)**

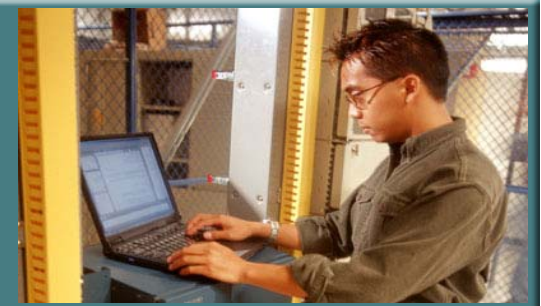


3

GLOBALIZATION



**Competition, Supply Chain
Management, Global Markets**





Device functionality is blurring...

For Consumers and Businesses: Any Service, Any Device



At Work, at Home, on the Road

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The “end-to-end argument”

“suggests that functions placed at low levels of a system may be redundant or of little value when compared with the cost of providing them at that low level”

*End-To-End Arguments In System Design.
1984. ACM Transactions on Computer Systems,
V.2, N.4, p. 277-88.*

*J.H. Saltzer, D.P. Reed, & D.D. Clark
MIT Laboratory for Computer Science*

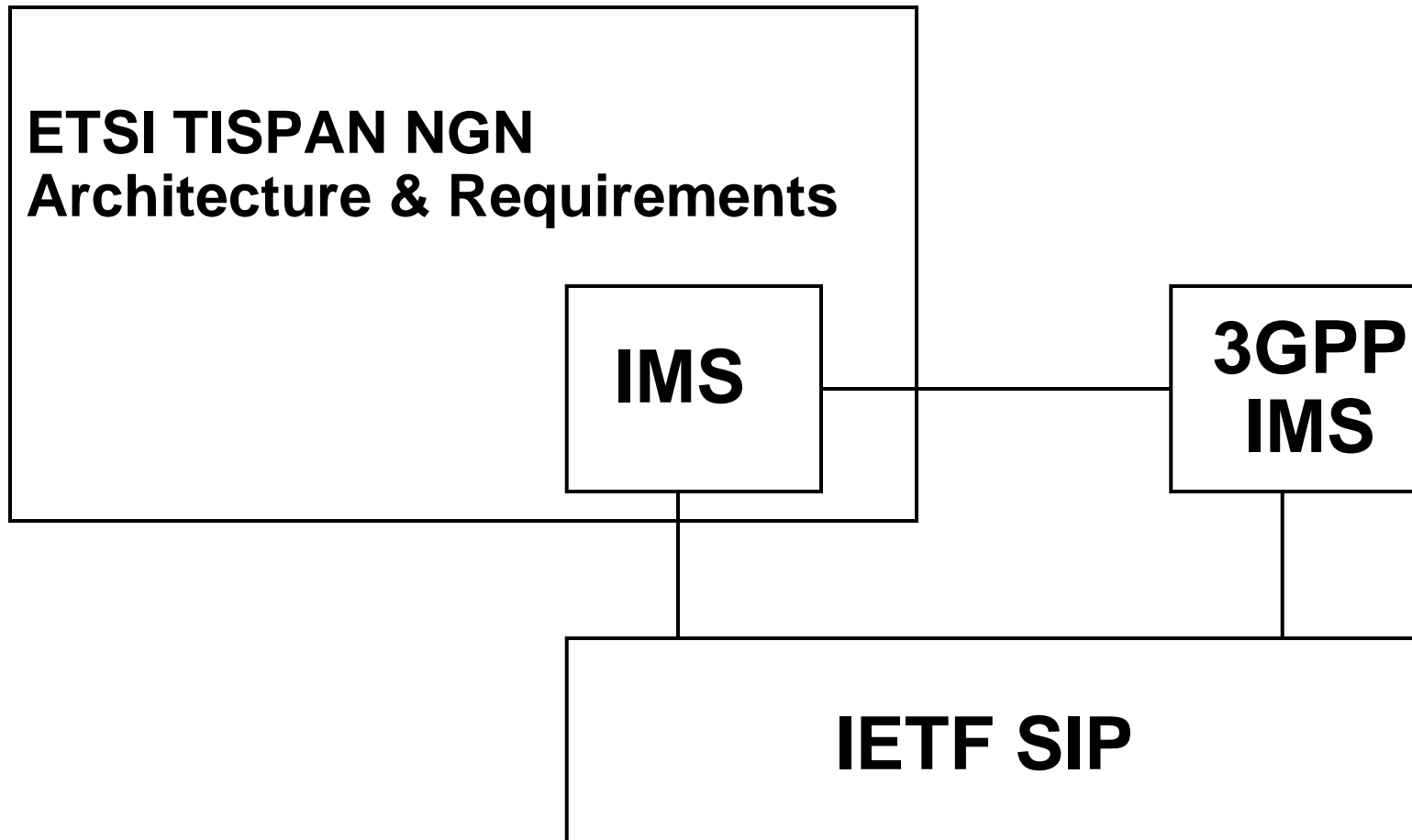


Network services

- o Despite the "end-to-end argument" some services are probably best offered in the network e.g. Content filtering / parental control, but there are not that many
- o Challenges from Internet services (Skype, Google



Underlying technology defined by IETF & common with the Internet





ITU-T's Definition of NGN

- Packet-based transfer
- Separation of control functions among bearer capabilities, call/session, and application/service
- Decoupling of service provision from transport, and provision of open interfaces
- Support for a wide range of services, applications and mechanisms based on service building blocks (including real time/streaming/non-real time services and multi-media)
- Broadband capabilities with end-to-end QoS and transparency
- Interworking with legacy networks via open interfaces
- Generalised mobility
- Unfettered access by users to different service providers
- A variety of identification schemes which can be resolved to IP addresses for the purposes of routing in IP networks
- Unified service characteristics for the same service as perceived by the user
- Converged services between Fixed and Mobile networks
- Independence of service-related functions from underlying transport technologies
- Support of multiple last mile technologies
- Compliant with all Regulatory requirements, for example concerning emergency communications and security/privacy, etc.



Convergence and Regulation

- o Telecoms
 - Traditionally detailed regulation of basic telephony service
 - Historically *de-jure* or *de-facto* monopolies
 - Competition now widely regarded as best means of development
 - Regulation for **universal service**
- o Internet
 - Developed without detailed control which has resulted in rapid growth
 - Social interests have become increasingly dependent on the Internet leading to demands for basic regulation
 - Regulation for **confidence**
- o Media
 - Vertical integration of market
 - Well regulated
 - Regulation of **content**



Regulatory Convergence

- o Regulation independent of technology
 - e.g. Malaysia 1988, EU 2002
- o Why shouldn't NGN & Internet regulatory regimes also converge?



Convergence & Competition

Mobile - Fixed

NGN - Internet

- o Convergence of technology & regulation
- o Focus on end-user who has to be prepared to pay for telecommunications services for investment to pay returns