



Economics of Inter-Carrier Transport Services: The ETICS Perspective

Peter Reichl

FTW Telecommunications Research Center Vienna

Nicolas Le Sauze

Alcatel-Lucent Bell Labs France

The ETICS Team

Economics and Technologies for Inter-Carrier Services



Basic facts:

3 yrs (01/2010 – 12/2012)

Total budget: 12.8 M€

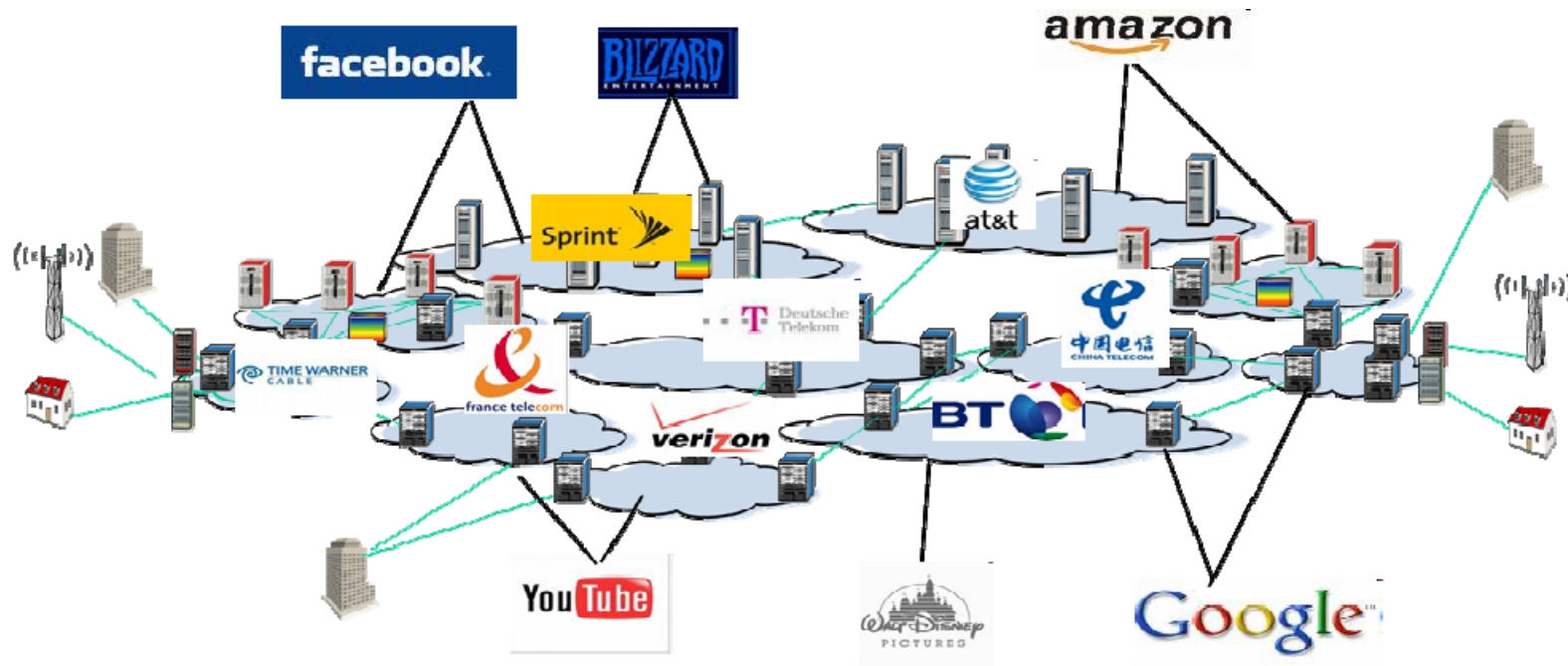
EC contribution: 8 M€

Consortium:

17 partners (sound mix of
technology + economy):
6 operators, 5 vendors,
6 academic partners

Advisory Panel:

Further members along
the value chain: vendors
(Juniper), IT/cloud
infrastructure provider
(Oxalya), application/
content provider (Akamai)

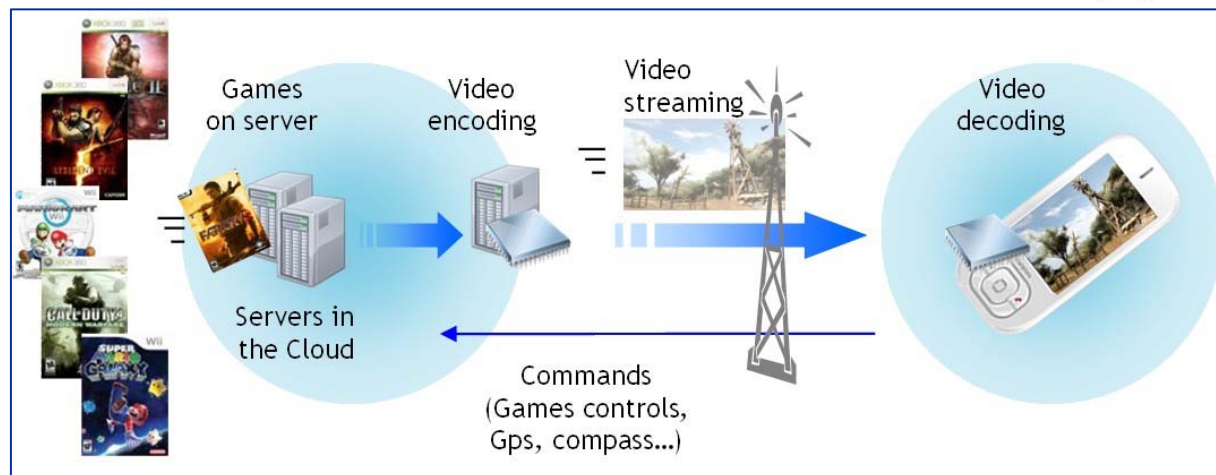
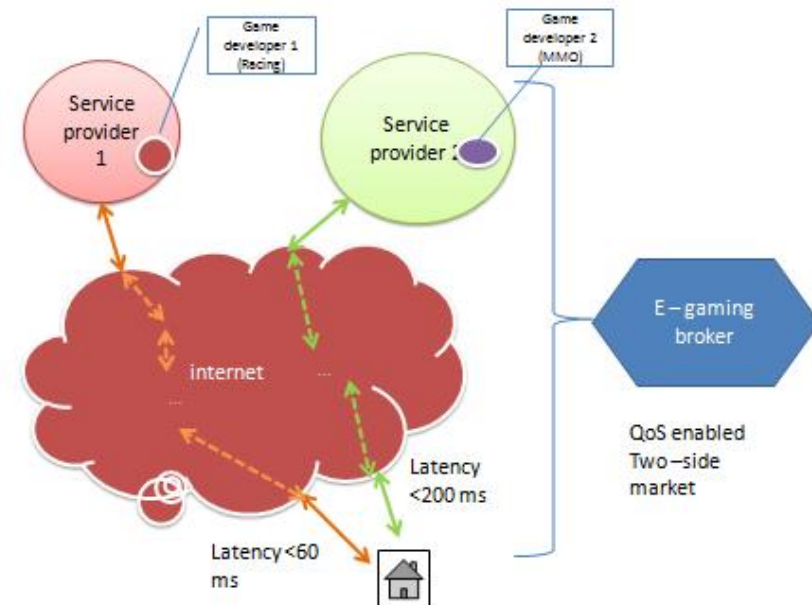


- Network & services interconnect: a complex ecosystem
 - Open public interconnect through the Internet: static, best effort based
 - Private interconnect: static, QoS aware, mostly bilateral agreements
- Future networks should be open and QoS capable
 - No blocking of service innovation
 - Quality of experience as key element for future services

- Basic project idea: tight integration of business and network operations in order to enable inter-operator QoS provisioning
- Create a business ecosystem with incentives for all actors to have service and usage-driven dynamic interconnection agreements
 - Equal quality accessibility for all (telcos & non-telcos services)
 - Sustainable deployment for carriers
 - Sustainable use for application/content providers
- Develop technical solutions to enforce the business QoS interconnect agreements on heterogeneous network infrastructures
 - Dynamic provisioning/configuration of network resources to provide soft and hard QoS assurance across carriers
 - SLA assurance processes to monitor contracts
 - Overall automated processes to ease the deployment of services

- Pragmatic evolutionary approach to provide short and longer terms answers to the questions posed above
- Service scenarios characterizing technical and business requirements
 - Limitations of current solutions
 - Actors, roles, incentives for ETICS-like solutions
 - Identification of new services + evolution of current services, considering
 - end user perspective of the future networks
 - business perspective of the future networks
 - wholesale transport services in the future networks
- **Interconnection Value Networks**
 - Extension of value chain model by stressing value creation through inter-organizational network of relationships, interdependencies and activities
 - Static (network structure) vs dynamic aspects (lifecycle, dynamic capabilities)
- **Definition of new business models and architecture components**

- Remote execution of game software
- Results sent using streaming based solutions
 - no need of dedicated machines that must be maintained/updated/etc.
 - important requirement to reduce OpEx of the operators' services.
- Stakeholders: game provider, cloud provider, several network providers
- Requirements: real time guarantees

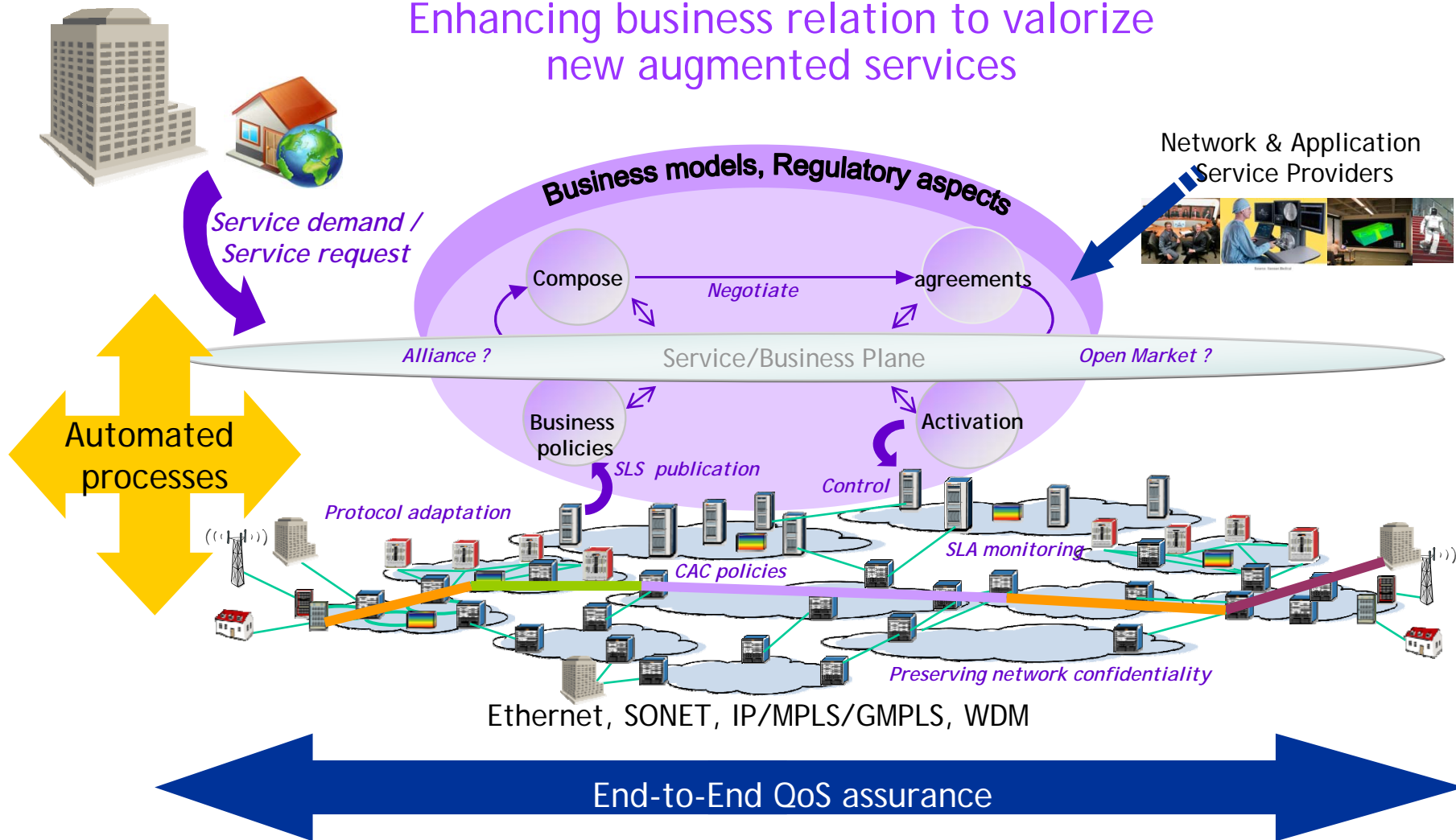


- **Widespread flat rates** and all-you-can-eat pricing schemes by ISPs end up generating high volumes of data transmission, resulting in **network congestion and increasing transport costs**
- **Escalating peer-to-peer traffic** further stresses process of network congestion and increases costs for ISPs
- **Growing importance of content and service providers** that bring value proposition strategies to the industry and **starting to have market power** (e.g. Google/YouTube)
- **Heavy hitters** behavior hinders a fair usage of network resources, compromising quality assurance for other users (in particular in mobile networks)

- **Current bilateral agreements hardly cope with the increasing complexity** and heterogeneity of the services and the network.
- **Business innovation** (including high quality services) **is not supported** by the limited scope and variety of current agreements.
- **Value creation does not correspond to appropriate revenue streams** and sometimes does not even cover resource consumption and investment sustainability.
- **Value networks can not quickly adapt to business needs** with dynamic interactions among large numbers of loosely coupled actors.

- Current status:
 - „Tiers model“ → customer-provider model vs shared cost model
 - Collaboration models (alliances):
 - Technological alliances → interoperability (protocols/services)
 - Alliances for sharing of ancillary resources → without potential for differentiation on the market
 - Market product alliances → offering composed products without loss of market autonomy
 - Open competition models (trade market) → providers publish services in a market subject to customer auctions
- **Wanted:** optimized revenue sharing mechanism providing incentives for all actors to offer advanced end-to-end network service delivery
- **Idea:** use (cooperative) game theory

Enhancing business relation to valorize new augmented services



- Requirements for E2E QoS assurance
 - Basic scenarios: GaaS, telepresence, enhanced VPNs, etc.
 - New incentive business models and technological developments
 - Delay assurance as key element (not only bandwidth)
 - Dynamic & automated contracts and resource provisioning mandatory
 - Deployment of E2E QoS interconnection schemes sustainable for all actors
- Early technological solutions being proposed
 - Coordination between service plane processes (implementing new business models) and control & management processes
 - @ Service plane: network SLA discovery/publication and composition
 - @ Control & management planes: PCE, PM as appropriate frameworks for communication between carriers using standards protocols & processes
 - But: still some limitations
 - Heterogeneous technologies: fix & mobile, connection-oriented vs connectionless
 - Soft and hard QoS assurance → large variety of technical and economical needs
 - Open interfaces → network capabilities exposure + network service composition



The End



Thank You Very Much!



www.ict-etics.eu

reichl@ftw.at

nicolas.le_sauze@alcatel-lucent.com