

Future Internet Research &
Experimentation - FIRE
Workshop
EC, DG INFSOM-F4

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Do we face a paradigm shift in the use of the Internet?

- Current Internet model: e2e TCP/IP signaling, **Producer-Consumer** model
- Trends
 - From traditional ISPs to **Consumer-Consumer** brokerage services:
 - Search engines, content managers e.g. *Google*
 - Peer-to-peer mediators e.g. *Skype, e-Bay*
 - Multimedia Content Providers (triple/quadruple-play services, FMC)
- Pressing needs for:
 - Ubiquity, globalization, mobile ambient computing: Dramatic increase in address space, routing complexity, requirements for VPN's at all levels
 - End-User segmentation: QoS/billing classes, **hybrid Packet/Circuit** Switching
 - Business level agreements aka. GSM: Mobility, roaming, AAA
- IPv6 may answer many shortcomings (but not all) of the current Internet:
 - Address explosion, routing, support of multicasting, mobility, ambient – ubiquitous computing...
 - Promoted by EU, Japan, China... *not popular in the USA*
 - Supported by CISCO, MS...
 - Many open issues (DNS, security...)

Disruptive Network Research Testbeds & NRENs-GÉANT2

- US GENI Approach:
 - Clean slate infrastructure for core and access (including Wireless and Sensor networks)
- Europe:
 - Existing hybrid Research & Education networks (**NRENs, GÉANT2**) are ready to support disruptive experiments in parallel to IPv4/v6 & “circuit switched” high-end users, via virtualized/sliced testbed interconnections:
 - WDM, 10 GigE Optical Private Networks, GigE - SDH slicing
 - MPLS, Premium IP VPNs
 - GÉANT is a federal network interconnecting 31 NRENs
 - ***End-Users are connected (and billed) via their respective NRENs***
 - ***Industrial and academic RTD labs (e.g. FIRE supported testbeds) fall within NREN Acceptable Use Policies (AUP's)***
 - ***e2e coordination on monitoring and provisioning supported via GÉANT2/NREN tools***
 - Multi-stakeholder interaction needs strengthening: NRENs/GÉANT, Researchers, Vendors, Service Providers