

FIA Valencia – Towards a FI Architecture

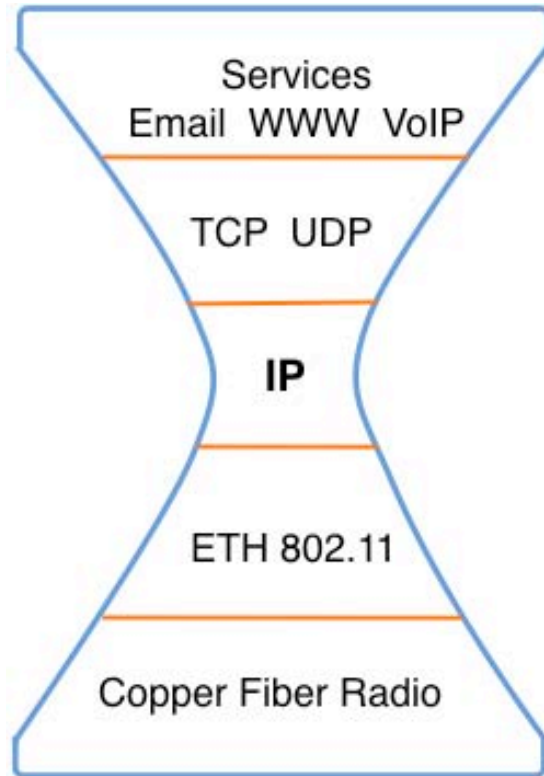
Session 1 - Need for new reference models for the Future Internet and its design goals

Session 2 – EU concrete /available research results, with evidence that they could work

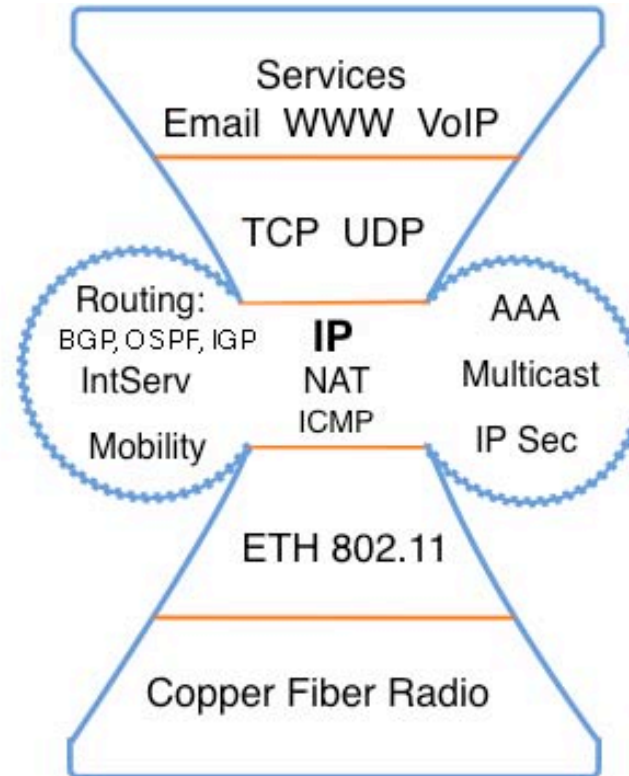
Session 3 - Move concepts to standardisation and practice

Caretakers: Alex Galis, Alex Gluhak, Marcus Brunner, Henrik Abramowicz, Theodore Zahariadis, Stefano De Panfilis – from 4 FIA Working Groups MANA, FCN, FISO, RWI

Current Internet Architectural Model



Data Plane



Control Plane

Current Internet Architectural Model

Factors of success:

- **Hourglass Paradigm:** Every System on IP and IP on Every System
- **KISS Principle** : “Keep it Simple, Stupid” (i.e. today optimisation is tomorrow’s bottleneck) D. Isenberg
- **Simple network layer → Services are realised at the end-hosts**
 - Robust & scalable communications
 - Adaptable to unpredictable new applications (i.e. source of innovation)
- **Increasing Societal dependency on Internet**

Current Internet Architectural Model

Bottlenecks / Limitation:

- **Disappearance of the 'End-host only' concept** (i.e. edge networks; new nodes : sensors, mobile devices;)
- **Lack of in-system management** (i.e. information, decision, implementation – closed control loops for realising management requirements)
- **Trustworthy User / Network / Service** (i.e. end-host protocols can and are altered → many security issues)
- **Best effort service delivery**
- **No explicit media & content handling**
- **Size & Costs:**
 - $N \times 10^9$ connectivity points - status: reaching maturity and maybe some limits
 - $N \times 10^5$ services /applications - status: fast growing
 - $N \times 10^3$ Exabyte's content - status: fast growing
 - Cost structure: 80% (→90%) of lifecycle costs are operational and management costs - status: reaching crisis level
- **Ossification:** reaching crisis level
 - A lot of missing and interrelated features; missing enablers for integration and orchestration of Nets, Services, Content, Storage
 - Substantial barriers to innovation with novel services, networking systems, architecture and technologies

Need for new reference models – Session 1

- **Introduction & Objectives of the FI Architecture track & Session no.1 - Alex Galis - University College London**
- **FI Design Goals (Functional and architectural metrics; Cost performance metric potentially from different stakeholder perspectives) Dimitri Papdimitriou – Alcatel- Lucent (15 min)**
- **Example FI Reference Models:**
 - **Future Converged Network Reference Model - Consequence of novel access technologies Mikail Popov – Acreo AG (15 min)**
 - **Radio Networks - Panagiotis Demestichas - University of Piraeus (10 min)**
 - **RWI Reference Model- Srdjan Krco – Ericsson (10 min)**
 - **FCN Reference Model - Theodore Zahariad – Synelixis (10 min)**
 - **FISO Reference Model – Frederic Gittler – HP Labs (10 min)**
 - **MANA Reference Model - Alex Galis – University College London (10 min)**
- **How to evaluate and compare architectures Kurt Tutschku - University of Vienna (15 min)**
- **Q&A Session 1 (27 min)**

Available research results – Session 2

- Introduction to Session 2 - Marcus Brunner - NEC
- Polymorphic Internet
 - ANA project view: Christian Tschudin - University of Basel (13 min)
 - 4WARD project view: The 4WARD System Model - Defining Network Architectures for Future Networks - Martin Johnsson – Ericsson (13 min)
- Virtual Infrastructures (Network, Service, Storage): What is the role of abstraction? How far are we from commercial world? Are we achieving transparency? Validated promises / Results? Management/Operations of Virtual infrastructure
 - Service Computing Clouds - RESERVOIR project Yaron Wolfstal – IBM (13 min)
 - Virtual Networks - 4WARD project: Djamal Zeglache - Télécom SudParis, Institut Télécom (13 min)
 - Management of Virtual Infrastructure - Autol project - Alex Galis - University College London (13 min)
 - Sustainable Identity Framework for the Future Internet - SWIFT project - Armadeo Sarma –NEC (18 min)
- Content based Networking
 - Publish-Subscribe networking PSIRP project - Arto Karila - Helsinki Institute for Information Technology (13 min)
 - Content delivery SEA project – Giovanni Pau – UCLA (13 min)
 - Media centric networking - Adolfo M. Rosas - Telefonica TID (13 min)
- Q& A Session 2 (26min)

Move concepts to standardisation / practice– Session 3

- Introduction to Session 3 - Henrik Abramowicz - Ericsson
 - Move FI Research into practice - closing the standardisation gap - Didier Bourse - Alcatel-Lucent (17 min)
 - Standard Organizations
 - ITU-T SG 11 Focus Group on Future Networks Takashi Egawa – NEC (17 min)
 - ETSI ways of standardizing Future Networks Ultan Mulligan – ETSI (17 min)
 - ETSI FI Architecture ISG - Industrial Specifications Group Guillermo Cisneros – UPM (17 min)
 - How to make use of Open Source (as alternative way of creating “standards”) / What facilitators are required (directory, IPR problems) Rui Aguiar - University of Aveiro (17 min)
 - FI tournament: Competition & Cooperation - How to Steer Internet Evolution - Tanja Zseby - Fraunhofer Fokus (17 min)
 - EU Initiative: Towards architectural design principles and a reference architecture for the Future Internet - Arian Zweegers EU INFSO (5 min)

 - Q&A Session 3 (20 min)
 - Wrap-up: Architecture Track - FIA caretakers (12 min)
- (Documenting reference models/architecture + Define a time line /Working Groups)