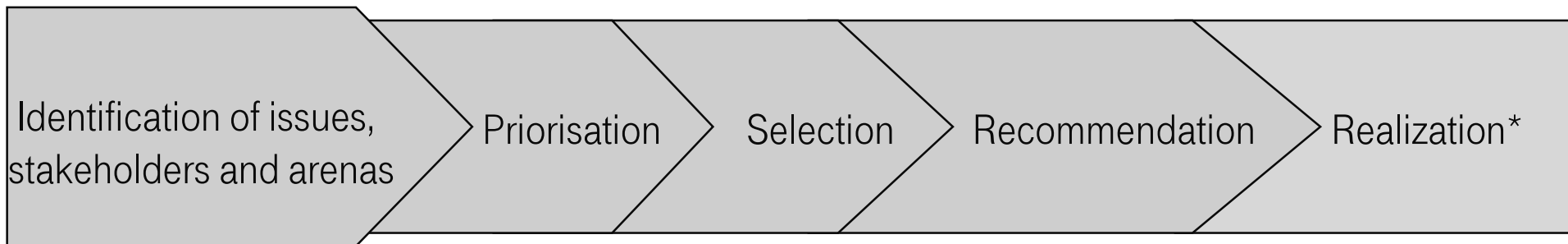# IPv6 Trials Framework

First thoughts on strategic issues for the IPv6 Task Force

24.6.2001 Contributors: DT, FT

Proposed procedure for an IPv6 Trials Framework

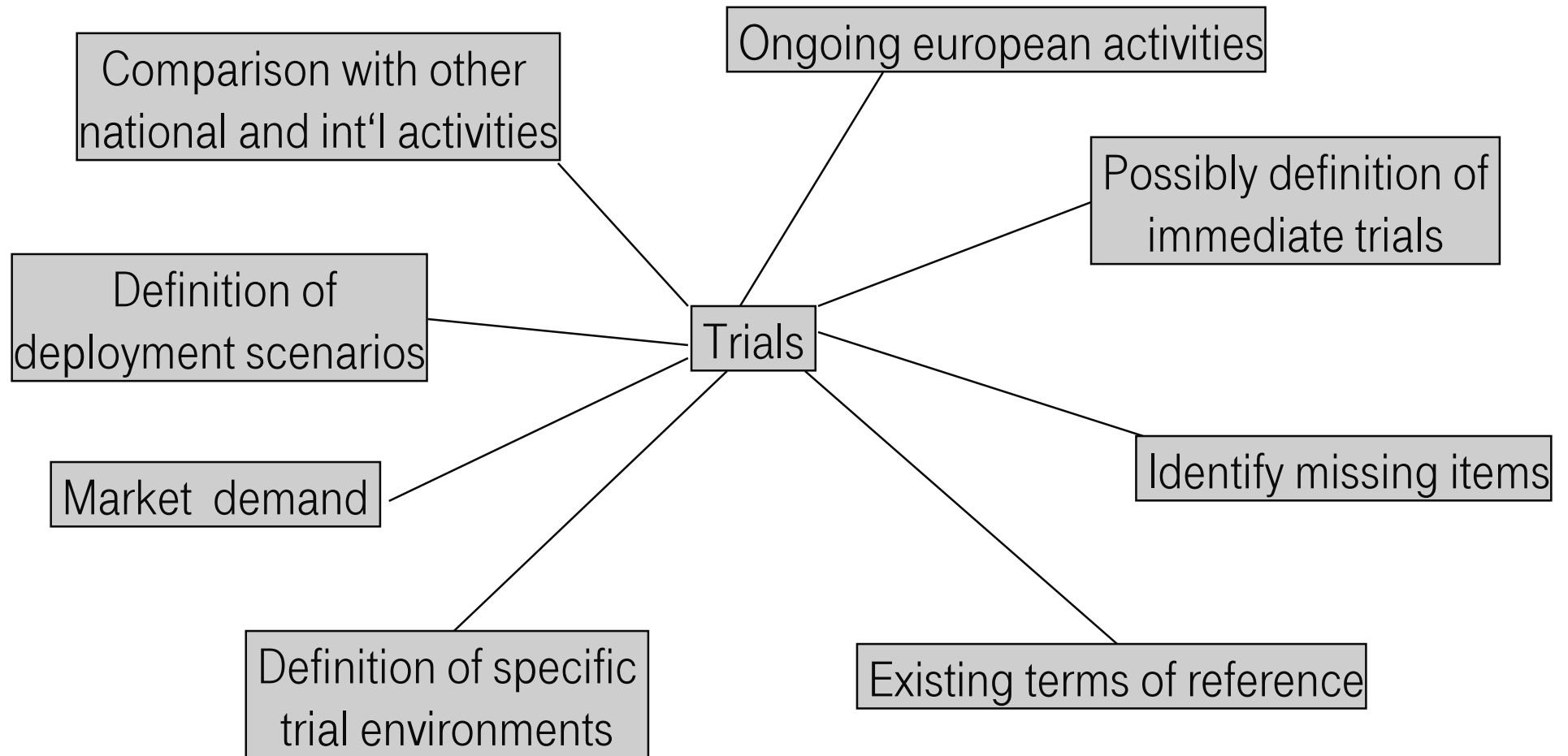Identification of issues, stakeholders and arenas → Priorisation → Selection → Recommendation → Realization*

*Immediate realization is not in the scope of the task force's activities

Identification of issues

Identification of issues

- What issues can be identfied currently?

- At what stage of the issues life cycle is each issue?

- What issues are likely to emerge in the near future?

- What alternatives are available to manage the issues?

Some direction of thoughts on a IPv6 trial framework

Ongoing european activities

Comparison with other national and int'l activities

Possibly definition of immediate trials

Definition of deployment scenarios

Trials

Identify missing items

Market demand

Definition of specific trial environments

Existing terms of reference

Comparison with other national and int'l activities

- Japan
  - Commercial services (IIJ, NTT)
  - Research prgramme with 5 topics, IPv6 being one of them
  - Well-known IPv6 R&D activities (WIDE, KAME)
- Korea
- USA
  - Internet 2
  - ...
- Identification of competitive advantages
- Identification of interoperability issues
- We should propose an operational template and what criteria do we choice and apply for the comparison
- We should take into account the regional context in the comparison (we must analyse regional IPv6 trails and commercial services deployed and then we identify the requirements and the needs of European actors and finely we should establish action plans (the strategies of deployment and the investments associated)
- As "i-Mode story" which brought a spectacular demonstration concerning the anticipations of 3G services, "Japanees IPv6 story" is an anticipation and a real demonstration too in IPv6 domain. It's a good basis. We should learn and adapt to our own context.

Compare ongoing european activities

- EU
  - 6INIT
  - 6WINIT
  - 6NET
  - NGN
  - Euro6IX
  - @Hom

- EURESCOM
  - The Armstrong IPv6 project (P 1009)
  - Mobile IP in the Core of UMTS networks (P1013)
  - The Tsunami IPv6 project (P1113) (aka AMP IPv6)

Comparison of existing terms of reference

- Which items are particularly important?
- With a view to implement IP Multimedia under Release 5 in 2003, industry will be requested to submit contributions to 3GPP to accelerate the pace of development of specifications work on IPv6 for 3G mobile communication systems (UMTS);. 3GIP which is a driver, its activities seems to be now in stand by and 3GPP has to much to do with R5.
- To define a RoadMap of R5 deployment the operators could choice in current R5 specification their mappings related to their requirments and needs. (Nokia has implemented IP multimedia R5. FTR&D will evaluate this solution next year when it will be available).
- The IPv6 Task Force should definie a view regarding R5 to help the industry to develop products. An IST project could be a way to built partnerships with vendors and to accelerate the pace of development and deployment.
- 3G operators to establish mechanisms for exchanging information on the use of IPv6 with a view to develop guidelines and best practises on the transition to IPv6;
- Operators and service providers, to consider on a priority basis how best to evolve towards IPv6 and to take early steps to obtain adequate IPv6 address allocations, while ensuring the users rights are safeguarded;

Comparison of existing terms of reference

- Service providers (providing access through, telephony links, xDSL, Cable, fixed wireless to Internet services) to offer IPv6 capable services, by end 2003,. It is an important issue, in FTR&D we are working in this field. Which scenario do we consider? Dual stack, IPv6 native or translation or mix ? If the services seem to be identified (IP access services), the industry is not ready (Cisco's IPv6 ADSL road map semes to be the only one defined and available). Concerning others vendors (egg and chicken problem!).

- To accelerate the deployment of IP6 by this strategic segment (IP Access), and stimulate the vendors to develop IPv6 equipments (in particular BAS: Broadband Access Servers of ADSL), one way could be to lauch an IST project aroud this question. The requirments of each family of actors (access, transit (backbone) operators, ISP, VISP, IAP, vendors, content providers and users and their position in the chain of value could hepl writing the specifications and constructing the roadmaps. The industry needs and claims those roadmaps to lauch the development of equipment.

Comparison of existing terms of reference

■ Telecommunications operators to complete conversion of all "legacy" systems to IPv6 capability by end 2005;. I think we should speak about transition not conversion. So, this operation could take many years. The deadline seems ambitious. How to reach this goal? We must demonstrate the benefict to adopt this conversion (Roadmap of deployment, market parts,..).

■ Conversion to IPv6 of Europe's Research and Education Networks (comprising the National Research and Education Networks and the European backbone GEANT), by 2003-2004. It is a particular community and its members are note representative of commercial clients, but the advantage is that it concerns all European countries. Could we transform this users or at less a significant part of them to commercial users? It would be a biggest IPv6 trial in Europe (it's a rule issue with academic world)

■ Introduction of IPv6-based systems in cars, aircraft and freight-transport vehicles and infrastructures by end 2004;and in home appliances. To reach this objective, this industry must be involved (the approch used in japanees programme in such application domain could be adapted. IST projects wider than @Hom one could be lauched to support this important field of IPv6 deployment.

Comparison of existing terms of reference

- IPv6 connectivity in all new consumer-electronic devices by 2005;

- Enabling IPv6-based m-commerce by 2005;

- Increase and re-focus of the EU support to RTD and Trans-European Networks to accelerate and facilitate the coherent transition to IPv6 in the period from 2002-2004.

- Strengthening of IPv6 R&D activities within the IST Programme (and proposal of measures for FP6) notably on those aspects relating to inter-working and interoperability between systems and networks, to the development of innovative IPv6 based services and applications, and to middle-ware and management tools, by end 2001. IPv6 management issue (Equipments management, network management and services management must be a priority which must be integred earlier in all specifications).

- One IPv6 function or feature implemented in an IPv6 equipment does nor exist if it's not managed or visible by the management system!

- We should push standard boddies (IETF) to develop IPv6 MIBs (to improve and enhance current specification and their implementaion by vendors)

- Vendors of management plateforms must develop IPv6 management platform and IPv6 management protocol to IPv6 domains)

Definition of specific trial environments

- Mobilty

- GPRS/UMTS

- Realtime
  - IP-telephony
  - Television
  - Radio

- M-Commerce

- E-Commerce

- Security

- Entertainment
  - announcement of IPv6 enabled game terminals (On line games is an important market, it concerns young people early adopters of innovative technologies and we must promote it. A special programme could be dedicated to this topic.

Definition of deployment scenarios

- Private customer / user scenario
  - Home Environment & Smart Home
  - Mobility
  - Security
- Business customer / user scenario
  - Mobility
  - Security
- ISP / Online Services scenario
  - Transit
  - Exchange
  - Perring
  - High-Speed Networking
  - Convergence in the access (fixed an mobile)
- Telco / Mobile Service Provider scenario
  - Micro&Macro/Mobility
  - Addressing
- Content Provider scenario

Market demand and offer

- ■ What is the demand?
  - – Question asked by the vendors. They need figures and our strategy of deployment
- ■ Could supply keep parce with demand?
  - – Question asked by operators and we need credible vendors roadmaps
- ■ Availability of IPv6 hardware and software solutions
- ■ Availability of alternative solutions
  - – credibility
  - – scalability in the context of a wide scale deployment
  - – limitations in term of features and services supported and provided
  - – cost in comparison to IPv6 solutions
  - – scenarios of deployment, road map and migration/integration to the target scenario (is it IPv6 one?)

Possibly definition of immediate trials

- Trials that should be performed immediately
- TBD

Identify missing items

- Which issues are necessary for the introduction of IPv6 that are not yet addressed?
- How to deploy the tool IPv6 efficiently

Identification of Stakeholders

Identification of Stakeholders

- What stakeholders are currently involved in each issue?

- What stakeholders are likely to emerge regarding each issue?

- What are stakeholders' demands and claims?

- What impact are these stakeholders likely to have on the issues identified?

Telco's expectations on IPv6 and trials

- IPv6 should bring two advantages:
  - New service offerings for the customer
  - Cost reduction of internal production

- Trials should be focussed in areas which are non-competitive
- Trials should focus on completely new areas. There should be no redundancy with existing trials
- Trials should be limited in scope and time
- Trials should not overlap with existing commercial services
- One of the goals should be a focus on interoperability
- Trials should help Telcos to solve transition/migration/intergration problems
- Trials should focus on issues which are commercially viable and of use for the end customer? How to involve representative customers (entreprises and residentials)
- Trials should focus on deployment of Mobile IPv6 in large scale
- Trials should help Telcos to solve migration scenarios of Mobile IP (2 migrations scenario: MIPv4 and after MIPv6 or one migration scenario directly MIPv6

R&D expectation on IPv6 and trials

- Some academic problems are yet on the table: transition mechanisms (DSTM for example)

- Some problems related to deployment must to be solved

- Issue related macromobity by Mobile IPv6 in fixe and mobile networks

- Network mobility by Mobile IPv6 vesus mobility by application layer- - the scope of each on and application domains
  - complementarity

Large and SME's expectation on IPv6 and trials

- .... & more

Backup

Identification of arenas

Identification of arenas - questions

- In which arena is each issues?

- In which arenas will future issues emerge

- What alternatives are available in selection and operation within arenas?

Classification Proposal in 3 IPv6 RoadMaps and some related specifications of Trails

We tried to classify 3 roadmaps (Equipments, Networks, Services) regarding Fixe and Mobile, Entreprise, Public needs

	Fixe Network	Mobile Network	Entreprise services	Public services
IPv6 Equipment RoadMap	*Core Network routers Routers (P) *Edge routers (PE) *BAS (ADSL) *v6 DNS *Firewwall	*SSGN *GGSN *v6 DNS *Firewall *Terminals	*DNS *Firewall *client routers (CE)	*Terminals *IPv6 appliances (cars, fridges, PDAs,..) * Personal routers
IPv6 Network RoadMap	*IP operators backbones * ADSL access network *ISDN/modem access network	*GPRS Core network * UMTS Core network * IPv6 UMTS R5 network	* IPv6 LAN *IPv6 WLAN *Intranet	*IPv6 Home networking
IPv6 Services RoadMap	*IPv6 Connectivity * IPv4/v6 Tunnels *IPv6 VPN * Addressing *Native IPv6/PPP * ADSL	* v6 Mobile Portals * v6 Web *Mobile access services * VoIP6 services *v6 DNS *v6 DHCP * IP Multimedia services *Games on line *Mobility services *Security	*IPv6 VPN *v6 QoS v6 *VoIP6 *IPv6 Connectivity *Addressing *Security	*IPv6Connectivity * v4/v6 Tunnels *IPv6 VPN * Adressage *Native IPv6/PPP *ADSL *v6 Web *IPv6 Servers *v6DNS *v6DHCP *Games on line *v6 Portails

IPv6 Trails and Chain of Value related to 3 IPv6 RoadMaps Model
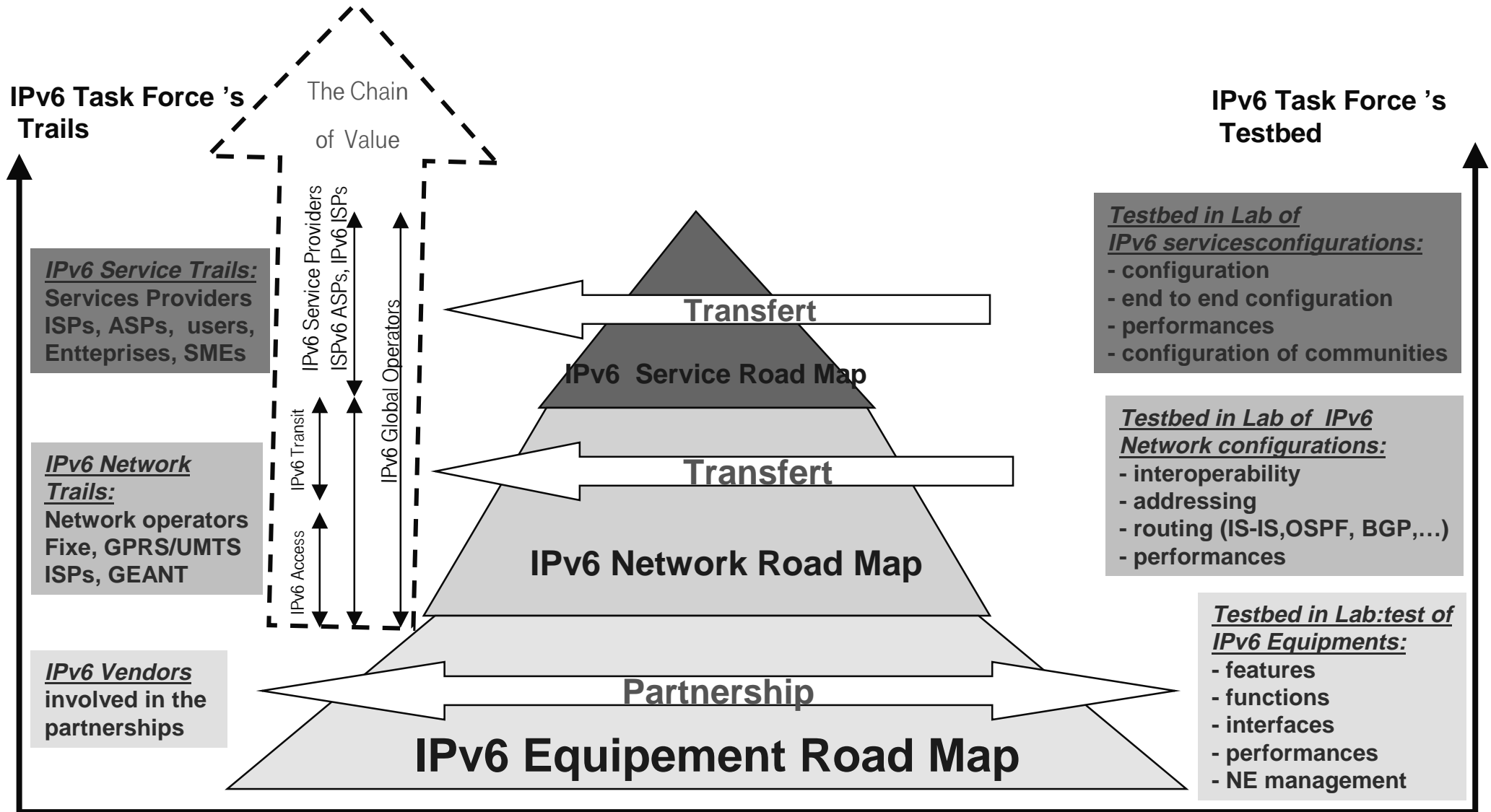
Comments from J. Da Silva

- Include home scenarios
- White goods (fridge with IPv6 chip)
- Car industries