

Framework Programme 7



“Future Media Internet Coordination action”

Contract no.: 249065

Deliverable D5.4

Final report on dissemination and standardisation activities

Project Acronym	NextMEDIA				
ICT Project Number	FP7-249065				
Project URL	www.fi-nextmedia.eu				
EU Project Officer	Mr. Georgios Kaifas				
Project Coordinator	Name	Federico Álvarez		Affiliation	UPM
	Email	fag@gatv.ssr.upm.es	Phone	+34-91 336-7344	Fax +34-91 336-7350
Deliverable Name	Final report on dissemination and standardisation activities				
Code name	D5.4				
Nature	Report		Distribution Type	PU	
Responsible Author(s)	Name	Tomas Piatrik		Affiliation	QMUL
	Email	tomas.piatrik@elec.qmul.ac.uk	Phone	+44-20-7882-7880	Fax +44-20-7882-7997
Abstract (for dissemination)	This document reports on the dissemination and standardisation activities for the second year of the NextMedia project. This involves disseminating project activities to a wide range of targets, attending of exhibition events, organising special sessions, publishing research results achieved from project clusters, standardisation monitoring and supporting the creation of the standardisation group in the future media internet area.				
Keywords	Dissemination, workshops, conferences, exhibitions, special issues, publications, standardisation				
Contractual Date of Delivery	31/10/2011				
Status	Final				
Quality assurance readers	Paul Moore		Oscar Mayora		
result	Ok		ok		

Table of Contents

LIST OF FIGURES	5
LIST OF TABLES	7
EXECUTIVE SUMMARY	8
1 Introduction	9
2 Web Site and Dissemination Material	9
2.1 The official NextMEDIA Web Site.....	9
2.2 Dissemination Material	11
2.2.1 Project Leaflet and Posters	11
2.2.2 NextMEDIA Newsletter	11
2.2.3 NextMEDIA Presentation	12
2.2.4 NextMEDIA Social Networks.....	12
3 Clustering with other projects.....	12
3.1 FCN meetings	12
3.2 FMI-Task Force meetings	14
3.3 FMIA-Think Tank meetings and Workshops.....	17
3.4 FIArch Open Workshops.....	19
3.5 6 th FP7 Concertation meeting, Brussels.....	22
3.1 7 th FP7 Concertation meeting, Trento	23
4 Participation in Exhibitions and Events	24
4.1 6 th FIA Workshop in Ghent	24
4.2 Standardisation Workshop in Ghent.....	27
4.3 7 th FIA Workshop in Budapest	28
4.4 NEM Summit, Torino.....	32
4.5 IBC 2011, Amsterdam.....	32
4.6 IETF Workshop, Prague	33
5 Conferences, Workshops and Special Sessions.....	34
5.1 Special Session on Technologies and Applications for Social-Networks and Internet of Things Integration at CASoN 2011	35
5.2 EU-Japan Joint Workshop in Kyoto.....	36
5.3 The Canada-EU Future Internet Workshop,.....	37
5.4 FMN-IPTV Workshop in Shanghai.....	38
5.5 3rd Japan-EU Symposium on the “Future Internet”, Finland	40
6 NextMEDIA Final Workshop	40
6.1 Session on “The Future of Networked Media and the Internet: Facts, Reflections and the Road Ahead”	41
6.2 Session on “Standardisation”.....	42
6.3 Session on “Architectures”	44
6.4 Closing Panel: Future Internet Architectures	48
7 Publications: Proceedings and Journals.....	49
7.1 Springer Mobile Networks and Applications (MONET) Journal – Special Issue on Mobility and Social Networks Confluence	50
7.2 FIA Books	50
7.3 White papers and NextMEDIA acknowledged publication	51
8 NextMEDIA Standardisation Activities.....	52

8.1	NextMEDIA Support of the Standardisation Group Formation.....	52
8.2	Standardisation monitoring and regulatory implications of Future Media Internet.....	55
8.3	FIA Standardisation Support Group	62
9	Conclusions	64
	ANNEX 1: NextMEDIA Dissemination Materials	65
	ANNEX 2: Questionnaire on Research Orientation and Standardisation Focus.....	70
	ANNEX 3: Analysis of Research Orientation in the EC Networked Media Unit.....	74
	ANNEX 4: Analysis of EU projects and industry participation in IETF	76
	ANNEX 5. The Call for Papers for FIA Book 2012	80
	ANNEX 6. FIA Standardisation Support Group	82
	ANNEX 7. Poster of the FIA Standardisation Support Group.....	83
	ANNEX 8. Identification of standardisation organisations relevant to future media internet.....	84
	ANNEX 9. Identification of the (pre-)Standardization projects intentions or/and commitments or/and achievements	95

LIST OF FIGURES

Figure 1: The Snapshot of the NextMEDIA website	10
Figure 2: From left: Paul Moore (Atos-Origin), Irene Schmidt (Atos-Origin), Federico Alvarez (UPM) and Tomas Piatrik (QMUL) during the FMI-TF meeting in Brussels. 14	
Figure 3: The FMIA-TT members discussing main issues of the position paper during the meeting in Ghent.	17
Figure 4: A moment from the 3 rd FIArch workshop in Brussels.....	21
Figure 5: Participants of the 6 th FP7 Concertation meeting	22
Figure 6: A moment from the plenary session during the Concertation meeting.....	23
Figure 7: (Standing from left): Theodore Zahariadis (Synelixis), Isidro Laso Ballesteros (EC) and Dimitri Papadimitriou (Alcatel-Lucent) during the open discussion in FIA workshop	24
Figure 8: Isidro Laso Ballesteros (EC) giving his talk during the FIA workshop	26
Figure 9: From left: Federico Alvarez (UPM), Paul Moore (Atos Origin), Lyndon Nixon (STI International), Jim Clarke (TSSG), Hannes Tschofenig (NSN), Dimitri Papadimitriou (Alcatel-Lucent) and Georgios Stamoulis (AUEB) as a moderators of open forum during the FIA workshop.	27
Figure 10: Tomas Piatrik (QMUL) next to the FISA stand in FIA Ghent	27
Figure 11: Key note speakers during the session on Interactive Media Experience	28
Figure 12: Ebroul Izquierdo (QMUL) giving his talk during the Information Centric Networks session	29
Figure 13: Paul Moore in the Atos booth during the ICB conference.....	33
Figure 14: Participants of the IETF Workshop in Prague	33
Figure 15: (from left) Tomas Piatrik (QMUL), Theodore Zahariadis (Synelixis), Rüdiger Martin (EC) and Hannes Tschofenig (NSN) during the IETF Workshop.....	34
Figure 16: Participants of the joint conference in Salamanca including CASON2011. 35	
Figure 17: Participants of the Workshop in Kyoto.....	37
Figure 18: A moment from the workshop in Canada	38
Figure 19: (from left) Oscar Bonastre (Miguel Hernandez Univ.), Keith Ross (Politechnico NY) and Oscar Mayora (Create-Net) during the INFOCOM Workshop 39	
Figure 20: A moment of the FIA workshop in Poznan	40
Figure 21: Franck Le Gall (left) concluding the Standardisation session	43
Figure 22: Some of the Organisers of the Architectures Session during the workshop 44	
Figure 23: Dimitri Papadimitriou (Alcatel-Lucent) giving his talk during the session. 47	
Figure 24: Theodore Zahariadis (Synelixis) (left) together with other invited speakers answering questions from audience.....	49
Figure 26: The CDNI BoF session chaired by Francois Le Faucheur (Cisco) and Richard Woundy (Comcast)	54
Figure 30: NextMedia Leaflet (version 1).....	66
Figure 31: NextMedia Leaflet (version 2).....	67
Figure 32: NextMEDIA Poster.....	68
Figure 33: NextMEDIA Newsletter	69
Figure 34: Research Challenges Votes on the Questionnaire.....	74
Figure 35: Expected Impact Votes on the Questionnaire	74
Figure 36: Number of Authors per Company.....	76
Figure 37: Number of RFCs per continent	76
Figure 38: Number of RFC Authors per continent.....	77
Figure 39: Number of RFCs (Considering EU as a single country).....	77

Figure 40: Number of recent RFCs (Considering EU as a single country).....	77
Figure 41: Number of IETF drafts (Considering EU as a single country)	78
Figure 42: Comparison of continents over the Years	78
Figure 43: Comparison of countries over the Years.....	78
Figure 44: Number of WGs in different areas.....	79
Figure 45: Leaflet for FIA Standardisation Support Group	82
Figure 46: FIA Poster introducing FIA Standardisation Support Group	83

LIST OF TABLES

Table 1.	Partners list	8
Table 1.	FCN participants/members	13
Table 2.	Results from standardisation questionnaires asking for research areas of interest	59
Table 3.	Summary of research interests for standardisation.....	60
Table 4.	IETF Area Directors.	79

EXECUTIVE SUMMARY

This document reports on the dissemination and standardisation activities for the second year of the NextMedia project. This involves disseminating project activities to a wide range of targets, attending of exhibition events, organising special sessions, publishing research results achieved from project clusters, standardisation monitoring and supporting the foundation of the standardisation group in the future media internet area.

Disclaimer

This document contains material, which is the copyright of certain NextMEDIA contractors, and may not be reproduced or copied without permission. All NextMEDIA consortium partners have agreed to the full publication of this document. The commercial use of any information contained in this document may require a license from the proprietor of that information.

The NextMEDIA Consortium consists of the following companies:

No	Participant name	Participant short name	Country	Country
1	Universidad Politécnica de Madrid	UPM	Coordinator	Spain
2	ATOS Origin	ATOS	Contractor	Spain
3	Centre for Research and Technology Hellas	CERTH	Contractor	Greece
4	CREATE-NET	CREATE	Contractor	Italy
5	Queen Mary University of London	QMUL	Contractor	UK
6	Synelixis Solutions Ltd	Synelixis	Contractor	Greece

Table 1. Partners list

The information in this document is provided “as is” and no guarantee or warranty is given that the information is fit for any particular purpose.

The user thereof uses the information at their sole risk and liability.

1 Introduction

The main objective of the nextMEDIA coordination action is to enhance the coordination of the efforts in Europe towards producing a clear situation of the Future Media Internet and support the results of the developments of the European projects. To achieve this, nextMEDIA has created many dissemination channels during the first year to advertise and spread excellence of the European research in Future Media Internet world-wide and attract the prominent scientists and company managers to the events. This includes scientific oriented activities such as the organisation of conferences/workshops, special issues in dedicated journals and collaboration events. In the second year of the project, NextMEDIA continues to create more dissemination channels to keep the community updated with project recent and forecoming activities, thus, to encourage participation and cooperation in the area of Future Media Internet. NextMEDIA is contributing also to standardisation activities. This includes standardisation monitoring, regulatory implications on future media internet and supporting the launch of the standardisation group in the future media internet field.

This deliverable reports on dissemination and standardisation activities carried out in the second year of the nextMEDIA project. The production of this deliverable was led by QMUL.

2 Web Site and Dissemination Material

The nextMEDIA web site and the dissemination materials are ways to raise awareness of the nextMEDIA activities. The website has been created to be a “social website”, providing tools to interact with interested people and to allow them active participation in our project. The dissemination material includes posters, leaflets, press releases, presentations, a six-monthly newsletter, etc. all of which have been distributed in relevant events.

2.1 The official NextMEDIA Web Site

The nextMEDIA web site is providing useful information concerning the project description, news, publications, results and other relevant material. During the second year the website has been periodically updated as new information becomes available.

The website is a central point for project dissemination. It offers information about the project and about nextMEDIA related events. It also provides samples, publicity material and technical information for download. From the website it is possible to access all information concerning the project and any visitor can participate and share the available content over several social networks, like Facebook, Twitter or YouTube; an RSS channel is also available for subscription. Through the website visitors can also access easily any document concerning the project including documents from outside the consortium.

On the website (in collaborative tools), a visitor can find how to:

- participate in our activities (the Future Content Networks group, The Future Media Internet – Task Force, the Future Media Internet Architecture Think Tank, the standardization activities, etc.),
- start discussions about the topics expressed in the project moderated by the nextMEDIA beneficiaries,
- write documents, e.g. for white papers jointly between projects,
- share peoples thoughts with us in social networks and collaborate using social networks with other researchers.

The screenshot shows the NextMedia website interface. At the top, there is a login section with fields for 'Username' and 'Password', a 'Remember Me' checkbox, and a 'Log in' button. Links for 'Forgot your password?' and 'Forgot your username?' are provided, along with a 'No Account Yet? Create an account' link. Below the login section is a navigation menu with links: Home, About nextMEDIA, Results, Dissemination, News and Events, Collaborative tools, and Groups. A 'Contact Us' link is also present. The main content area features a yellow banner with text about the Media Internet supporting professional and novice content producers. To the right of the banner are social media icons for Facebook, Twitter, LinkedIn, and YouTube. Below the banner is a 'Welcome to NextMedia Project' section with a video player and a description of the Media Internet's evolution. To the right of this is a 'Video' section with a video player and a message about the Adobe Flash Player. Below the welcome section is a 'News and Events' section with several articles, including 'Nextmedia's Final Workshop at FIA in Poznan', 'Session at FIA Poznan 2011', 'Workshop on Future Media Networks and IP-based TV (FMN-IPTV)', 'New Deadlines', and '6th FIA Workshop in Ghent'. To the right of the news section is a 'Newsletter Subscribe' section with an email input field and a 'Subscribe' button. At the bottom right is a 'Most popular' section with a list of links to various resources.

Figure 1: The Snapshot of the NextMEDIA website

Also very relevant in the dissemination of the project is the support of young researchers and the community through the provision of lecture material, for example in the section “videos”. Here, conference talks relevant to the Future Internet topics have been updated periodically. By the end of the second year, nextMEDIA collected and published on the website more than 50 hours of invited talks from well known conference related to Future Internet area. To make the browsing through videos easier, recorded talks have been organised to 13 categories as listed below:

- Semantic Web
- Content Streaming
- Content Aware Networks
- Information Extraction and Data Mining
- Social Networking
- Content Searching, Finding and Retrieval
- Architectures for massive content distribution
- Semantic Web
- Content Streaming
- Content Aware Networks
- Information Extraction and Data Mining
- Social Networking
- Content Searching, Finding and Retrieval

For more information visit our web-site www.fi-nextmedia.eu or download our Deliverable 5.1 which contains rich information about the web-site.

2.2 Dissemination Material

NextMEDIA has produced a wide range of publicity materials, either in electronic (accessible from the website) or in physical format (paper or optical media). Examples are:

- Leaflets
- Newsletters
- Posters
- NextMEDIA presentations
- NextMEDIA social networks

During the second year, nextMEDIA has printed and distributed more than 1000 leaflets and several posters during the events described in this document.

2.2.1 Project Leaflet and Posters

The project leaflets, which were created during the first year, are being distributed during nextMEDIA events to introduce the project activities to the community.

The posters are another form of dissemination and have been used during relevant events to attract attention to our activities. Posters and leaflets have been designed by QMUL and can be found in Annex 1.

2.2.2 NextMEDIA Newsletter

A nextMEDIA newsletter is published biannually to disseminate all nextMEDIA activities. The aim is to provide a detailed yet broadly coherent overview of project objectives and achievements, suitable for both specialist and non-specialist audiences. During the second year, two issues of the newsletter have been created by QMUL with help from other partners (see Annex 1). NextMEDIA is using the special mailing list, including key contacts on projects and companies related to the areas of Networked Media and Future Media Internet, as a distribution channel to the right audience. Furthermore, newsletters have been uploaded to the website and distributed in exhibition events, conferences and workshops.

2.2.3 NextMEDIA Presentation

NextMEDIA created a number of presentations addressing various audience where the project activities are explained. The project has been verbally presented using presentations in different events relevant to Future Internet (FIA workshops, NEM Summit, FCN, FMIA-TT, FMI-TF, FIArch meetings and workshops, concertation meeting, etc.)

2.2.4 NextMEDIA Social Networks

NextMEDIA also uses social networks to communicate with world-wide researchers and to the general public interested in the Future Media Internet. Social networks started some years ago and nowadays are powerful communication channels between people around the world.

NextMEDIA does not want to be outside this wave, therefore provides the following:

- A group in Facebook for allowing (mainly young people) communication with the general public :
<http://www.facebook.com/?ref=logo#/group.php?gid=290386606968>
- A channel in YouTube for uploading and sharing visual information about Future Media Internet:
<http://www.youtube.com/nextmediaeu>
A twitter site, to inform our followers about activities related to FMI:
<https://twitter.com/nextMEDIAeu>
- A group for professionals in Linked-in:
<http://www.linkedin.com/groups?home=&gid=2702601&trk=anet ug hm>

In addition, as it can be found in the web-site section, users can share any public content of the web site in different social sites.

3 Clustering with other projects

NextMEDIA has been disseminated via current and new Co-ordination Actions and project Clusters such as the User Centric Media cluster, the Media Delivery Platforms cluster, the Search A/V cluster and the 3D Media cluster of the Networked Media Unit. Moreover, the ideas and the concepts of nextMEDIA has been disseminated in relevant discussion/working groups, namely Future Content Networks (FCN) group, Future Media Internet - Task Force (FMI-TF) group, Future Media Internet Architectures – Think Tank (FMIA-TT) group and Future Internet Architecture (FIArch) group. The related events to these clusters and groups which happened in the second half period of the project are described in the following sections in more details.

3.1 FCN meetings

After two successful meetings of the group in Brussels and Barcelona, the FCN group continued coordinating the work to support EC funded projects' contribution and participation to the FIA events. The third FCN meeting took place in Ghent, Belgium. The fourth FCN meeting was held in Budapest, Hungary and the fifth FCN meeting was held in Poznan, Poland, all in parallel with the FIA workshops. Numerous teleconferences took also place prior to the FIA workshops so as to ensure industrial participation to FIA.

The participants of all FCN meetings can be seen in the table below. Participants from SMEs and the Industry are in bold:

No	Participant Name	Affiliation
1	Federico Alvarez	UPM
2	Petros Daras	CERTH
3	Theodoros Semertzidis	CERTH
4	Anastasios Zafeiropoulos	CERTH
5	Theodore Zahariadis	Synelixis
6	Paul Moore	ATOS
7	Oscar Mayora	CREATE-NET
8	Tomas Piatrik	QMUL
9	Ebroul Izquierdo	QMUL
10	Naeem Ramzan	QMUL
11	Adolfo Rosas	Telefonica
12	Pierre-Yves Danet	FT/Orange
13	Peter Stollenmayer	Eurescom
14	Jari Ahola	VTT
15	Irene Lopez	Tekniker IK4
16	Antonio Camurri	University of Genoa
16	George Pavlou	University College London
17	Rafaelle Bolla	University of Genoa
18	Alberto Jose Gonzalez	i2CAT/UPC
19	Dimitris Protosaltou	University of Geneva
20	Cezary Mazurek	PSNC
21	Vincent Leroy	Yahoo
22	Barla Cambazoglu	Yahoo
23	Yiping Chen	CNRS – Labri
24	Susanne Kuehrer	A1 Telekom Austria
25	Tobias Burger	Salzburg Research
26	Sergios Soursos	Intracom Telecom
27	George Pavlou	University College London
28	Miodrag Temerinac	Uni- Novistat
29	Paul Walland	IT Innovation
30	Yves-Marie Le Pannerer	Technicolor
31	Francesco Nucci	Engineering
32	Ricardo Baeza-Yates	Yahoo
33	Dimitri Papadimitriou	Alcatel-Lucent
34	Stefan Haller	SAP
35	Hannes Tschofening	NSN
36	G. Feher,	BME, Hungary
37	Z. Korcsok,	iPont, Hungary
38	S. Spirou,	Intracom Telecom, Greece
39	V. Souza,	Ericsson
40	F. Salguero	Telefonica R&D
41	Laurent Ciavaglia	Alcatel-Lucent
42	Gerard Nguengang	Thales
43	W. Mohr	NSN

Table 1. FCN participants/members

3.2 FMI-Task Force meetings

Two FMI-TF meetings were organised in this period after the kick-off meeting in Brussels on February 2010. The second FMI-TF meeting took place in 30 November 2010, Brussels in EC premises, in parallel with the Fall 2010 concertation meeting. The focus of this meeting was on:

- Classifying the identified research challenges (short/mid/long term)
- Identifying application areas per research challenge with special focus on the Industrial view on how this research can be applied
- Identifying generic business models to realize the research challenges
- Setting the scene for the book on Media Internet.



Figure 2: From left: Paul Moore (Atos-Origin), Irene Schmidt (Atos-Origin), Federico Alvarez (UPM) and Tomas Piatrik (QMUL) during the FMI-TF meeting in Brussels.

The meeting agenda is shown below:

Tuesday, 30/11/2010, Brussels		
Time	Topic	Presenter/Moderator
15:30-15:40	Welcome from the EC	Isidro Laso-Ballesteros
15:40-16:30	White paper presentation & Classification of the identified research challenges	Petros Daras
16:30-17:15	Application areas per research challenge with special focus on the Industrial view on how this research can be applied	All

17:15-17:25	Coffee break	
17:25-17:50	Generic business models to realize the research challenges	All, moderated by Federico Alvarez
17:50-18:30	Business benefits	All, moderated by Petros Daras
18:30-19:00	Discussion on next actions /Time plan +AOB	Petros Daras
	Close of the meeting	

Third FMI-TF meeting took place on 13 April 2011 in Trento Italy. The main objective of the meeting was to identify the relevant research areas with respect to Future Media and Content-Centric networks with particular emphasis on Media.

- The topics of interest for the TF were:
 - to report the SoA in these areas including existing standards, relevant commercial systems, and potential limitations
 - to propose new research challenges,
 - to identify potential applications and impact of these challenges

The meeting agenda is shown below:

Wednesday, 13th April 2011, Trento		
Time	Topic	Presenter/Moderator
14:00 – 14:15	Meeting objectives	Federico Alvarez
14:15 – 14:45	Presentation of the results of the questionnaires	Petros Daras
14:45 – 15:45	Discussion on the priorities (applications, business benefits and models) for short-mid research challenges: a) Content and context fusion for improved multimedia access b) Multimedia, multimodal and deformable objects search	All
15:45 – 16:00	Coffee break	
16:00 – 17:40	Discussion on the priorities (applications, business benefits and models) for mid-long research challenges: a) 3D content generation leveraging emerging acquisition channels b) Immersive multimedia experiences c) Content with memory and behavior	All
17:40 –	Discussion on next actions	All

17:50		
17:50 – 18:00	Wrap-up and conclusions	Petros Daras / Federico Alvarez

After this meeting two more teleconferences were held to finalise the report

All TF members are shown in the table below:

No	Participant Name	Affiliation	e-mail
1	Federico Alvarez	UPM	fag@gatv.ssr.upm.es
2	Petros Daras	CERTH	daras@iti.gr
3	Theodore Zahariadis	Synelixis	zahariad@synelixis.com
4	Paul Moore	ATOS	paul.moore@atosresearch.eu
5	Oscar Mayora	CREATE-NET	oscar.mayora@create-net.org
6	Qianni Zhang	QMUL	Qianni.zhang@elec.qmul.ac.uk
7	Ebroul Izquierdo	QMUL	ebroul.izquierdo@elec.qmul.ac.uk
8	Marco Pellegrini	CNR	marco.pellegrini@iit.cnr.it
9	Hassnaa Moustafa	FT/Orange	hassnaa.moustafa@orange-ftgroup.com
10	Xavier Anguera Miro	Telefonica	xanguera@tid.es
11	Amar Aggoun	Brunel University	amar.aggoun@brunel.ac.uk
12	Noel O'Connor	DCU	Noel.OConnor@dcu.ie
13	Gaël Richard	IT Paris	gael.richard@telecom-paristech.fr
14	David Griffin	University College London	d.griffin@ee.ucl.ac.uk
15	Ralph Traphoener	EMPOLIS	Ralph.Traphoener@empolis.com
16	Aggelos Katsaggelos	Northwestern University	aggk@ece.northwestern.edu
16	Dimitris Protopsaltou	University of Geneva	Dimitris.Protopsaltou@miralab.unige.ch
17	Hyoung Joong Kim	Korea University	khj-@korea.ac.kr
18	Alexandros Nanopoulos	University of Hildesheim	nanopoulos@ismll.de
19	Peter Stollenmayer	EURESCOM	stollenmayer@eurescom.eu
20	Marian Ursu	Goldsmiths, University of London	m.ursu@gold.ac.uk
21	Doug Williams	BT	doug.williams@bt.com
22	Francesco De Natale	University of Trento	denatale@ing.unitn.it
23	Isidro Laso Ballesteros	European Commission	Isidro.LASO@ec.europa.eu

As a result of aforementioned meetings the TF prepared the white paper: "Social Networks Overview: Current Trends and Research Challenges", European Commission, Networked Media Unit, Information Society and Media, ISBN 978-92-79-18923-4 doi:10.2759/1559, Nov 2010

Moreover, the TF prepared the report “Research Challenges, Applications Areas and Business Models”. This document has been produced by a discussion forum of experts in the area of media Internet, namely the Future Media Internet – Task Force (FMI-TF). The FMI-TF aims to shape the research agenda and outline the research challenges in Future Media Internet in the years to come, to map these research challenges to specific application areas taking into account the industrial point of view and finally, to identify potential business models and business benefits that could address these challenges. More details about the outcomes from the meetings and the complete report can be found in Deliverable D1.2.

3.3 FMIA-Think Tank meetings and Workshops

The Future Media Internet Architecture Think Tank (FMIA-TT) has progressed with the creation of the FMIA Reference Model position paper. Theodore Zahariadis (Synelixis) is leading this activity and is the paper editor. The FMIA-TT Group had a meeting in parallel to the FIA Ghent workshop on 16 December 2010. During the meeting a detailed analysis of prepared position paper has been carried out.



Figure 3: The FMIA-TT members discussing main issues of the position paper during the meeting in Ghent.

The FMIA-TT workshop was organized on 15 June 2011 in Brussels. The purpose was to present the Reference Architecture and compare it with architecture coming from other domains (e.g. Future Internet of Services reference architecture, Future Internet of Things reference architecture).

The workshop agenda is shown below:

09:30	Welcome	Georgios Kaiafas (European Commission)
09:40	Introduction to the workshop and objectives. Future Media Internet general approach.	Federico Alvarez (UPM)
10:00	The Future Internet Architecture Group activities Including Q&A from the audience	Dimitri Papadimitriou (Alcatel-Lucent)
10:40	The Future Media Internet Architecture proposal (created by the FMIA-TT) Including Q&A from the audience	Theodore Zahariadis (Synelixis)
11:10	ALICANTE (FP7 project) media architecture	Christian Timmerer (Klagenfurt University)
11:30	COAST (FP7 project) media architecture	Th. Zahariadis (Synelixis)
11:50	ENVISION (FP7 project) media architecture	David Griffin (UCL)
12:10	NEXOF_RA Including Q&A from the audience	Piero Corte (Engineering)
12:45	Lunch	
13:45	Presentations from the audience: what are the new media Internet architectures? views on new media applications and services	Moderator: Petros Daras (CERTH/ITI)
15:00	Panel and discussion: How the media delivery platforms and media architectures are going to evolve? How to cope with the new media services and applications requirements How to support social networks in the new media Internet?	Panel: Adolfo Rosas Federico Alvarez Theodore Zahariadis Christian Timmerer
16:00	Way forward, next events and wrap-up	Federico Alvarez

In order to have more technical discussions, the FMIA-TT workshop was open only to a small group of experts. Overall 19 participants from 9 EC countries participated at the workshop. The list of participants follows:

	Name	Affiliation	Country	Type
1	Dimitri Papadimitriou	Alcatel-Lucent	Belgium	Industry
2	David Griffin	UCL	UK	Academic
3	John Cosmas	Brunel University	UK	Academic
4	Daniel Piret	Syneretek	Belgium	Industry/SME
5	Marco Masetti	Softeco SRL	Italy	Industry/SME
6	Bartosz Belter	PSNC (Poznan)	Poland	Academic
7	Christian Timmerer	Klagenfurt University	Austria	Academic
8	Theodore Zahariadis	Synelixis	Greece	Industry/SME
9	Ioannis Koufoudakis	Synelixis	Greece	Industry/SME
10	Petros Daras	CERTH	Greece	Research
11	Tomas Piatrik	QMUL	UK	Academic
12	Henri Quarat	INRIA	France	Research
13	Piero Corte	Engineering	Italy	Industry
14	Federico Alvarez	UPM	Spain	Academic
15	Mika Rantakkoko	Center for Internet Excellence	Finland	Research
16	Maurizio Cecciti	Telecom Italia	Italy	Industry/Telco
17	Adolfo Roza	Telefonica	Spain	Industry/Telco
18	Giorgos Kaiafas	European Commission	EC	
19	Isidro Laso	European Commission	EC	

In this open workshop, the FMIA-TT group presented the media architectures in research from both the research community and the industry perspective, established a discussion and received feedback from different European stakeholders and individuals. Based on the feedback, a new version of the reference architecture has been generated and distributed to the related projects of the unit. The impact of the FMIA reference model, produced by nextMedia is already obvious. The projects COAST, ALICANTE and OCEAN have already adopted part of the FMIA Reference Architecture, while COAST is also implementing that architecture and is planning to experiment on that.

3.4 FIArch Open Workshops

After a number of successful FIArch meetings and first open workshop of the FIArch group in the first year of the project, the FIArch Group moved to the next step which is the definition of the Future Internet Design Principles. The group moderator (Theodore Zahariadis) has prepared a Call for contributions which has been broadly distributed. As a result 12 high quality replies have been received. Dr. Zahariadis organized two PhCs on 9 and 13 May 2011, where all contributions were evaluated by the group members. Though there were different opinions, it was decided that contributions would be presented at the next FIArch workshop.

The 3rd FIArch workshop on the Design Principles took place in Brussels on 23 May 2011 at the EC premises.

The workshop agenda may be found below:

10:00-10:10	Introduction • Motivations and Objectives • Positioning (wrt to the FIArch work flow) • Timeline & Targets	I. Laso (EC)
10:10-10:50	Background material • Current principles/Brief overview incl. application of these principles • Mythology and facts	D. Papadimitriou (Alcatel-Lucent)
10:50-11:00	Break (15min)	
11:00-11:50	Open floor presentations • Each presenter 7 minutes • 15 minutes Q&A	Mod: S. De Panfilis • S. De Panfilis (Engineering) • I. González Alonso (Univ. of Oviedo, Spain) • P. Muller (TU Kaiserslautern, Germany) • I. Papafili (AUEB, Athens) • K. Howker (TSSG, UK)
11:50-12:30	Open floor presentations • Each presenter 7 minutes • 12 minutes Q&A	Mod.: D. Papadimitriou • E. Grasa (i2CAT Foundation) • Th. Zahariadis (Synelixis) • W. Chun (ETRI, Korea) • R. Kantola (Aalto Univ., Finland)
12:30-12:45	Internet Architecture - a policy tool for innovation?	Megan Richards (Director, DG INFSO)
12:45-13:00	Ongoing International Activities on Internet Principles?	Andrea GLORIOSO (EC)
13:00-13:25	Open floor presentations • Each presenter 7 minutes • 16 minutes Q&A	Mod.: D. Papadimitriou • P. Martinez (Murcia Univ., Spain) • K. Tutschku (Vienna Univ, Austria)
13:25-14:30	Lunch	
14:30-15:00	• Summary of the contributions • Arguments and Analysis	Th. Zahariadis (Synelixis) D. Papadimitriou (Alcatel-Lucent)
15:00-15:15	Break	
15:15-16:30	Open Discussion	Moderator: K. Howker (TSSG)
16:30-17:30	Desicions on the Next Steps (45min) • Results & Objectives • Structure & Outline • Timeline	Th. Zahariadis (Synelixis)



Figure 4: A moment from the 3rd FIArch workshop in Brussels

The presentations and the technical discussions had high technical quality and were summarized by Th. Zahariadis (Synelixis) and D. Papadimitriou (Alcatel-Lucent). Synelixis prepared the first draft of the FIA Design Principles document, which was circulated on 16/7/2011. After a pooling, 5 PhCs were organised on:

- 29 June
- 28 July
- 9 September
- 16 September

Via the PhCs a pre-final version of the Design Principles was formed, which was discussed in a 4th FIArch workshop on 23 September 2011 in EC premises in Brussels.

The agenda of the workshop is shown below.

10:30-10:40	Introduction Motivations and Objectives Positioning (wrt to the FIArch work flow) Timeline & Targets	I. Laso
10:40-11:00	Section 1 & 2 (Definitions)	D. Papadimitriou
11:00-11:15	Break (15min)	
11:15-13:00	Section 3-4 Editing Session	Th. Zahariadis
13:00-14:00	Lunch	
14:00-	Section 5	D. Papadimitriou

15:00	-Ioanna Papafili - Pedro Martinez Julia	Editing Session
15:00-15:15	Break	
15:15-16:30	Sections 5 (Cont.) - Eduard Garsia - Paul Muller - SOFI expert.	D. Papadimitriou Editing Session
16:30-17:00	Decisions on the Next Steps Results & Objectives Structure & Outline Timeline	Th. Zahariadis

The final draft of the FIArch Design Principles document was presented on the Future Internet Assembly (FIA) Poznan event on 24-26 October 2011.

3.5 6th FP7 Concertation meeting, Brussels

The 6th FP7 Concertation Meeting in Brussels on the 29th of November 2010 focused on bringing together the ongoing FP7 projects funded under the Networked Media and Search Systems objective, to facilitate the exchange of results and achievements, and to build consensus. The Unit's projects are organised into four clusters: 3D Immersive Interactive Media (3DIIM), Future Media Networks (FMN), Media Search (MS) and User Centric Media (UCM).



Figure 5: Participants of the 6th FP7 Concertation meeting

In order to keep each cluster informed about FIA activities that lay in the area of their interest, the nextMEDIA consortium has collected, analysed and categorised the different scientific and research areas that are covered by current and evolving Network Media clusters. Therefore apart from the plenary session presentation, at least one nextMEDIA delegate participated at each cluster in order to follow the discussions and collect the projects' research agendas and concerns.

In order to collect information about the will of the various projects to contribute to standards, NextMEDIA prepared and distributed new questionnaires during the project presentation at the concertation plenary session. By collecting and analysing the responses we were able to understand better the current situation in Networked Media research area and try to coordinate the projects of the unit to overcome the various obstacles. Overall, 24 questionnaires were returned completed. The questionnaire can be found in Annex 2 and analysis of the results can be found at Annex 3. Analysis of projects interest in standardisation is presented in Section 8.2.

3.1 7th FP7 Concertation meeting, Trento

The 7th FP7 Networked Media Concertation Meeting took place on 14-15 April 2011 at the Polo Scientifico e Tecnologico "Fabio Ferrari" in Trento, Italy. The first day of the event was devoted to workshops in four parallel sessions organized by the four clusters: 3D Immersive Interactive Media (3DIIM), Future Media Networks (FMN), Media Search (MS) and User Centric Media (UCM). The second day of the event, participants gathered in the plenary session. The NextMEDIA consortium participated at each cluster in order to follow the discussions and collect the projects' research agendas and concerns and presented the project activities.



Figure 6: A moment from the plenary session during the Concertation meeting

During the Spring 2011 concertation meeting, Th. Zahariadis made two presentations: one presentation in the Future Media Networks cluster describing the Network Overlay issues and the IETF CDNi BOF and one presentation in the Search Engines cluster describing the FIArch activities, the FMIA-TT activities and the IETF CDNi BOF.

Furthermore, 3rd NextMEDIA Newsletter has been distributed to all participants during the plenary session to disseminate project activities and outcomes.

4 Participation in Exhibitions and Events

NextMEDIA has brought outcomes to the broad research community and the European citizens at large by disseminating website, leaflets and posters in trade fairs, exhibitions and seminars. These included exhibits, conferences, workshops and several well-known events such as Future Internet Assembly (FIA) and NEM Summit.

4.1 6th FIA Workshop in Ghent

The 6th FIA workshop was held in Ghent, Belgium on 16-17 December, 2011. NextMEDIA participated on its own stand with posters and leaflets and all consortium beneficiaries explained to the attendees the scope and the objectives of the project.

Two of the nextMEDIA beneficiaries (Petros Daras and Theodore Zahariadis) participated in the teleconferences organised by the EC towards organising some of the BO sessions, which took place in Ghent. More specifically:

- Petros Daras (CERTH) and Theodore Zahariadis (Synelixis) were co-organisers of the BO session: “*Search as an architectural component;*”
- Theodore Zahariadis (Synelixis), Federico Alvarez (UPM), Petros Daras (CERTH) and Ebroul Izquierdo (QMUL) helped with the organisation of the BO session: “*Architectures*”



Figure 7: (Standing from left): Theodore Zahariadis (Synelixis), Isidro Laso Ballesteros (EC) and Dimitri Papadimitriou (Alcatel-Lucent) during the open discussion in FIA workshop

The organisation of the above mentioned BO Sessions, implies selection and invitation of speakers, agenda preparation and set content of the sessions. The summary of the above mentioned sessions is given below. More details about each session can be found in Deliverable D1.2

Session VIII: Search as an architectural component

The chairs of the session were Loretta Anania (EC– DG INFSO), Th. Zahariadis (Synelixis), J. Domingue (Open University), P. Daras (ITI) and A. Galis (UCL). The initial objective of this session was to highlight the search and discovery issues of different resources at the different stratum. This is a very broad topic. Quite different mechanisms (even philosophy and language) are currently used to discover/mine, describe, index and retrieve resources at each stratum. Due to time restrictions, the session was focused only in the area of content searching and retrieval, which may be the most challenging one, as content is and will grow much faster than any other resource and search engines need in most cases to extract and combine information rather than just discover it.

The presentation given during the session are summarised below:

• Introduction and context	Loretta Anania	EC – DG INFSO
• Search as an architectural component: searching for a new paradigm	Francesco Nucci	Engineering
• Next Generation Search	Ricardo Baeza-Yates	Yahoo!
• Visual Search as an architectural component	Alexis Joly	INRIA
• Discussion	Moderator: L. Anania (EC) Panel: R. Baeza-Yates (Yahoo!) F. Nucci (Engineering) A. Joly (INRIA) J. Domingue (Open University)	
• Conclusions- Discussion	Loretta Anania	EC– DG INFSO

The presentations are available on the FIA Ghent website (<http://fi-ghent.fi-week.eu/slides/>)

Session V: Architecture Group

The chairs of the session were Isidro Laso Ballesteros (EC– DG INFSO) and Theodore Zahariadis (Synelixis). The objective of this session was to present the activities of the FIArch group towards a Future Internet Architecture, collect feedback and comments from the FIA community and involve more experts presenting their point of view in the activities towards a Future Internet Architecture.



Figure 8: Isidro Laso Ballesteros (EC) giving his talk during the FIA workshop

The FIArch Experts Reference Group is composed of representatives of the most relevant FP7 research projects in relation to FI architectures and renowned industrial and academic experts, covering in a complementarily way all areas related to the Future Internet Architecture.

The presentations given during the session are summarised below:

• Introduction and context	Paulo de Sousa	EC – DG INFSO
• Rationale and Methodology	Dimitri Papadimitriou	Alcatel-Lucent
• Fundamental Limitations of Current Internet	Theodore Zahariadis	Synelixis
• Internet Architecture and Innovation	Isidro Laso Ballesteros	EC– DG INFSO
Open forum (5 minutes each):	Moderator: F. Alvarez (UPM)	
• R. Nejabati (University of Essex)	Panel:	
• W. Colitti (Vrije Universiteit Brussel)	D. Papadimitriou (Alcatel-Lucent),	
• W. Burakowski (Warsaw University)	S. Haller (SAP)	
• Ioan Toma (STI)	H. Tschofenig (NSN)	
	J. Clarke (TSSG)	
	L. Nixon (STI International)	
	P. Moore (Atos Origin)	
• Next steps and wrap-up	Isidro Laso Ballesteros	EC– DG INFSO

The presentations are available on the FIA Ghent website (<http://fi-ghent.fi-week.eu/slides/>)



Figure 9: From left: Federico Alvarez (UPM), Paul Moore (Atos Origin), Lyndon Nixon (STI International), Jim Clarke (TSSG), Hannes Tschofenig (NSN), Dimitri Papadimitriou (Alcatel-Lucent) and Georgios Stamoulis (AUEB) as a moderators of open forum during the FIA workshop.

4.2 Standardisation Workshop in Ghent

The workshop on standardization in the area of ICT took place on December 15th, 2010 within the program of the Future Internet Conference Week, in addition to other ICT related research events organized at ICC in Ghent, Belgium.



Figure 10: Tomas Piatrik (QMUL) next to the FISA stand in FIA Ghent

The main focus of the workshop was to discuss the role of research in the domain of standardization, in relation to other stakeholders in this field such as the industry and policy organizations. Tomas Piatrik (QMUL) represented NextMEDIA in this event and presented FISA standardisation WG during the poster session. Furthermore, NextMEDIA activities related to standardisation have been presented during the closing panel session.

4.3 7th FIA Workshop in Budapest

The 7th FIA workshop was held in Budapest, Hungary on 18-19 May 2011. NextMEDIA beneficiaries had active participation to this event. NextMEDIA partner QMUL organised the session: Interactive Media Experience. It should be noted that speakers and panelists of this session were members of the FMI-TF and the FCN group. Moreover, the FCN member UCL with the support of nextMEDIA organized the session: Information Centric Networking. NextMedia beneficiaries actively participated at this session. Finally, nextMEDIA participated in organizing the standardization session where nextMEDIA outcomes and supporting activities in standardization have been presented. The summary of above mentioned sessions is given below. More details about each session and its outcomes can be found in Deliverable D1.2.

Session II-1: Interactive Media Experience

Organizers of the session were Prof. E. Izquierdo (QMUL) and G. Feher (BME). The main objective of this session was to gather together European stakeholders in the field to discuss technologies that could contribute to achieve 3D immersive collaborative environments supporting realistic inter-personal communication, new content delivery architectures and underpinning economical models for 3D media search and recommendation. The session covered three key topics: social networks in 3D virtual environment, accessibility through mobile devices and efficiency of 3D media search and retrieval.



Figure 11: Key note speakers during the session on Interactive Media Experience

The presentation given during the session are summarised below:

14:00 – 14:05	Introduction to the session, E. Izquierdo (QMUL, UK)
14:05 – 15:20	Keynote talks Talk I: “Virtual Humans”, Nadia M. Thalmann (University of Geneva, Switzerland) Talk II: “3D Video Processing”, P. Eisert (HHI, Germany) Talk III: “3D Media accessibility through mobile devices”, P. Kovacs (Holografika, Hungary)
15:20 – 15:55	Panel discussion Panel chairman: N. O’Connor (DCU, Ireland) Invited panellists: Nadia M. Thalmann (University of Geneva, Switzerland), P. Eisert (HHI, Germany), Z. Korcsok (iPont, Hungary), P. Kovacs (Holografika, Hungary), E. Izquierdo (QMUL, UK), G. Feher (BME, Hungary)
15:55 – 16:00	Wrap up: G. Feher (BME, Hungary)

Session I-1: Information Centric Networks

Organizers of the session were George Pavlou (UCL) and Spiros Spirou (Intracom Telecom).

The goal of this session was two-fold: a) to raise awareness about ICN among academia, industry, and end-users, and b) to share the viewpoints of each stakeholder: content provider, content distributor, network operator and content consumer. Moreover, the session exposed the high-level issues in ICN: evolutionary vs. revolutionary approaches for content naming and delivery (what is the migration path), existing vs. prospective business models (how to incentivise and rationalise such a migration) and benefits vs. drawbacks (who and how will be affected by this migration).



Figure 12: Ebroul Izquierdo (QMUL) giving his talk during the Information Centric Networks session

The agenda of the session is presented below:

10:30 – 10:35	Welcome
10:35 – 10:55	Introduction to Information- Centric Networking George Pavlou, Professor, University College London, UK.
10:55 – 11:15	Each panellist shall make a 5-min position statement on the ICN high-level issues: evolutionary vs. revolutionary approaches for content naming and delivery (what is the migration path), existing vs. prospective business models (how to incentivise and rationalise such a migration) and benefits vs. drawbacks (who and how will be affected by this migration). Moderator: George Pavlou, Professor, University College London, UK. • Torsten Braun, Professor, University of Bern, Switzerland. • Ebroul Izquierdo, Professor, Queen Mary University, UK. • Bruno Kauffmann, R&D Engineer, FT/Orange, France. • Börje Ohlmann, Research Scientist, Ericsson Research, Sweden
11:15 – 11:35	Moderated discussion The discussion shall begin with a Q&A between moderator and panellists. The moderator shall gradually open the Q&A to the audience.
11:35 – 12:00	EU projects: position statements To stimulate discussion, the moderator shall invite 5-min position statements by relevant EU projects. Project position statements may not be contiguous, but could be injected into the discussion at appropriate points. Moderator: Spiros Spirou, Senior Engineer, Intracom Telecom, Greece • ALICANTE, Evangelos Markakis, Technological Educational Institute of Crete, Greece. • COMET, Francisco Javier Ramon Salguero, Telefonica R&D, Spain. • CONVERGENCE, Andrea Detti, University of Rome Tor Vergata, Italy. • ENVISION, Miguel Rio, University College London, UK. • PURSUIT, Arto Karila, Helsinki Institute for Information Technology, Finland.

	SAIL, Victor Souza, Ericsson Research, Sweden.
12:00 – 12:25	Moderated discussion (continued)
12:25 – 12:30	Summary and conclusions

Session II-4: Standardisation

The session was organized by Franc Le Gall and Jean-Charles Point with the help from members of the FISA group.

The session focused on the issue of pre-standardisation, which is the main interest of most R&D European projects; standard bodies have well identified this need by creating pre-standard or incubator groups within their structure. The goal of the session was to identify a number of pre-standardisation topics in the area of Future Internet that are general enough to attract many industrial participants and yet strict enough to come out with pre-standards in a reasonable time. Tomas Piatrik (QMUL) has presented nextMEDIA role in the FISA support group and underline nextMEDIA achievements in FIA sector, including all nextMEDIA organized Working discussions groups. Furthermore, he presented NextMEDIA analysis results of interests in standardization from the project in Networked Media sector.

The agenda of the session is presented below:

5 min	Agenda and session objectives	F. Le Gall (inno)
60 min.	Possible "cross-cutting" pre-standardisation tracks: Introductory speech: landscape of pre-standardisation and standardisation, possible paths for projects (15-20 min) - IoT research and standardisation - Management and Future Networks - Cloud computing - Architecture - Media	Mod. : Jean Charles Point (JCP Consult) Didier Bourse (Alcatel Lucent) Patrick Guillemin (ETSI, Strategy and New Initiatives), IERC, CASAGRAS2, Alex Galis (UCL) - UniverSELF Daniel Field, (Atos Origin) –SIENA Dimitri Papadimitriou (Alcatel-Lucent) Tomas Piatrik NextMEDIA
35 min	Closing panel: Pre-Standardization on Future Internet. Does it have to be exclusively at any specific entity? Which of the tracks look most promising? Are the chosen tracks too broad,	Mod. : Franck Le Gall Dimitri Papadimitriou (Alcatel-Lucent) Henrik Abramowicz

	should they be more focused? Are there too many tracks? Role of contributing projects in the decision process	(Ericsson) + open discussion
10 min	Conclusions and further work	Franck Le Gall

4.4 NEM Summit, Torino

The 2011 NEM Summit was hosted by Politecnico di Torino on 27-29 Sept. 2011, in the centre of Torino, Italy. The NEM Summit is an annual Conference and Exhibition annually organised by the NEM Initiative under the aegis of the European Commission (DG Information Society and Media). The event, both for the conference and exhibition parts, addresses ICT at large and more precisely topics related to networked and electronic media such as:

- Media-related applications and business models
- Content creation
- Networking and delivery infrastructure
- Content search and media presentation
- Technology drivers and enabling technologies

NextMEDIA distributed project leaflets and newsletter during the event in order to disseminate project activities to large ICT community.

4.5 IBC 2011, Amsterdam

IBC – International Broadcasting Conference - (www.ibc.org/) is the most important event for the broadcasting industry in Europe with the participation of almost 50.000 professionals from around the world. The general profile of visitors to IBC is eminently industrial with representatives from all of the important broadcasters and companies in the media and broadcast sphere.

IBC takes place annually in Amsterdam and this year ran between Sept 9 and Sept 14, 2011. Atos Research & Innovation had a booth in the Connected World section of the conference and NextMedia was one of the projects and assets that Atos presented to visitors. Another important aspect is internal dissemination in Atos. Most of the European Atos Account Managers for broadcast and New Media attended IBC and visited the booth where projects and activities such as NextMedia could be described to them. Furthermore, these Account Managers brought important clients to the booth to learn more about the different research activities.

Specifically, the following material was distributed to visitors:

- leaflets of NextMedia
- the NextMedia Newsletter
- a near final version of the NextMedia Future Media Internet Roadmap
- a NextMedia poster was part of the booth (see Figure 12)
- copies of White Papers coordinated by NextMedia (“Research *Challenges* and the Road Ahead”, Social Networks Trends and Research Challenges”)

Atos was represented by Paul Moore, David Salama and Irene Schmidt.



Figure 13: Paul Moore in the Atos booth during the ICB conference

4.6 IETF Workshop, Prague

The Internet Architecture Board, the IETF Internet Area, the IETF Routing Area, the IETF Applications Area, the Czech Technical University in Prague, and the European Commission organised a workshop on 25th March 2011 in Prague on the topic “Interconnecting Smart Objects with the Internet”.



Figure 14: Participants of the IETF Workshop in Prague

The workshop aimed to discuss the experience and approaches taken when designing protocols and architectures for interconnecting smart objects to the Internet and to investigate the area of integration in the following categories:

- Scalability
- Power efficiency
- Interworking between different technologies and network domains
- Usability and manageability
- Security and Privacy

NextMEDIA has submitted two position papers to the workshop:

- Theodore Zahariadis, Helen C. Leligou, Panagiotis Trakadas, Mischa Dohler, “Building trust among Virtual Interconnecting Smart Objects in the Future Internet”,
- Naeem Ramzan, Tomas Piatrik, Ebroul Izquierdo, “Scalable Video Coding in Networked Environment”.

Theodore Zahariadis (Synelixis) and Tomas Piatrik (QMUL) have actively participated in the discussions during the workshop and made important contacts with IETF beneficiaries.

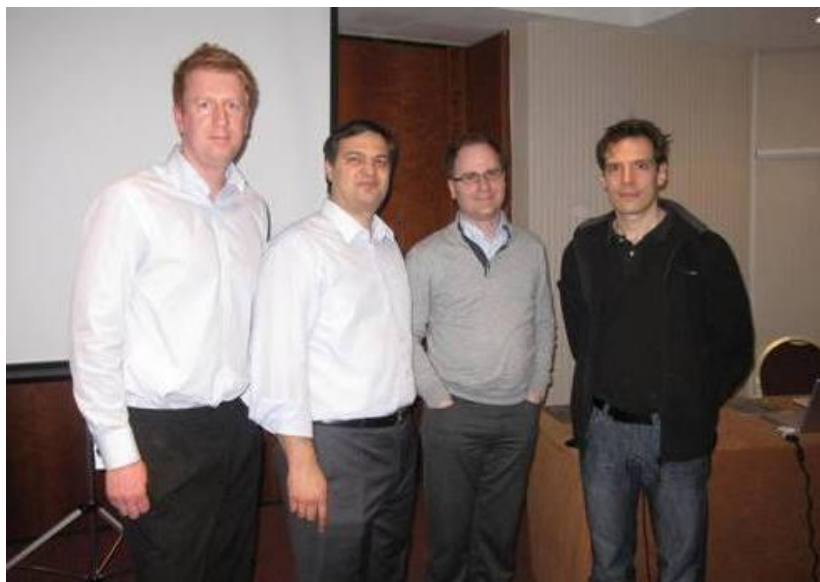


Figure 15: (from left) Tomas Piatrik (QMUL), Theodore Zahariadis (Synelixis), Rüdiger Martin (EC) and Hannes Tschofenig (NSN) during the IETF Workshop.

5 Conferences, Workshops and Special Sessions

NextMEDIA is promoting European research participation in top-notch events and forums such as leading Conferences, Panels and Journals. The main goal is to maximize the impact of the European positioning at scientific and industrial levels, (including SMEs) through identification of the main forums and venues and coordination of participation of key EU research actors.

In the first year NextMEDIA organised following conferences listed below:

- 1st UCMedia Conference in Venice 2009
- 2nd UCMedia Conference in Mallorca 2010

- IWSSIP Conference in Brasil 2010
- Special Session on Future Media Internet at TEMU 2010

More details about aforementioned conferences and their outcomes can be found in Deliverable D4.3. NextMEDIA continued with promoting research conducted at European level at international scale also in the second year and organized following Conferences, Workshops and Special Sessions:

5.1 Special Session on Technologies and Applications for Social-Networks and Internet of Things Integration at CASoN 2011

NextMedia representatives organized a Special Session on *Technologies and Applications for Social-Networks and Internet of Things Integration* during The Third International Conference on Computational Aspects of Social Networks (CASoN 2011) in Salamanca, Spain (Oct. 19-21 2011). The focus of the conference was the presentation and discussion of results about all aspects (theory, applications and tools) of intelligent methods applied to Social Network, and the practical challenges encountered and the solutions adopted.

The special session explored the different challenges involved in the integration of data originated from both physical (IoT) and online (Social Networks) sources taking into consideration to different research topics: e.g. large scale data integration, participatory sensing from multiple sources, correlation of physical-digital information, geo-located and online social networks correlations, trust and security. The call for papers can be found in Annex 6.



Figure 16: Participants of the joint conference in Salamanca including CASON2011

The special session aimed to foster discussions on a comprehensive list of challenges; including, but not limited to:

- Mobility and geo-localization and their impact to/from social networks
- Wireless sensor networks, mobile devices and social network sensing
- Implications to system design of integrated physical and social network sensing
- Correlation from personal & virtual group spaces and sensors

- Impacts of searching and mining the Internet of things to social networks
- Multi-source information integration
- Search in pervasive social databases
- Models and representations of real-virtual dynamics
- Participatory sensing
- Case studies and applications of mixed sensing and mining
- Content centric networks
- Social metrics for network operation
- Middleware for mobile, wsn and social networks
- Web dynamics and grid/cloud computing
- Security, privacy, reputation and trust issues
- Users studies and human factors in real-online combined sensing
- Applications of physical-online sensing

More details about the special session including the list of accepted papers can be found in Deliverable D4.4.

5.2 EU-Japan Joint Workshop in Kyoto

As a result of NextMEDIA participation in an event organized by the EU Commission, “The 3rd EU-Japan Symposium on Future Internet and New Generation Networks” (Tampere, Finland, Oct. 2010), the need and opportunity for establishing direct dialog between EU and Japanese counterparts in strategic research topics was identified. One of the emerging fields of interest identified in such opportunity was the Integration of Physical-World Sensing with Online Social Networks and Web Mining. In this regard, researchers from Japan and NextMEDIA agreed to organise a joint workshop on this topic. The EU-Japan Joint Workshop on “Challenges and Opportunities of Online Social Networks and Physical Sensing Integration” has been organised by NextMEDIA in Kyoto, Japan on 10 June, 2011.

The main motivation was on the exchange of experiences of Japanese and NextMEDIA counterparts and in the identification of where and how this topic is evolving. The Workshop intended to create a common space for EU-Japanese researchers to discuss about their futuristic visions, challenges, opportunities and potential collaborations in such field.

Workshop topics are listed below:

- Future Mobile Social Networks Applications and Business Models
- Mobility Geo-Localization and Social Networks
- Implications to System Design of Integrated Physical and Social Network Sensing
- Crossroads between Internet of things, Internet of Media & People
- Multi-Source Information Integration and Scalability
- Challenges of Participatory Sensing
- Case studies and applications of mixed sensing and mining
- Social Metrics for Network Operation
- Middleware for joint Mobile, WSN and Social Networks
- Web dynamics and grid/cloud computing
- Security, privacy, reputation and trust issues



Figure 17: Participants of the Workshop in Kyoto

The major outcome of the NextMEDIA event in Japan is the production of a white paper containing the reflections of European and Japanese researchers about the topic of online social networks and physical world sensing integration. More details about the workshop and its outcomes can be found in Deliverable D4.4.

5.3 The Canada-EU Future Internet Workshop,

The Canada-EU Future Internet Workshop 2011 took place in March 2011 in the Canadian city of Waterloo. The major objective of this event was to explore prospects for deeper exchange and collaboration between the Canadian and European research communities in the area of "Future Internet (FI)" in Europe. The event was co-sponsored by the EU and the National Research Council of Canada. The agenda for the event can be found at <http://www.futureinternet-internetdufutur.nrc-cnrc.gc.ca/eng/index.html>

The program focused on the following topics associated with Future Internet:

- Collaboration between Canada and the EU
- Content and Media
- Testbeds and Experiments
- Services and Clouds
- Wireless and Mobile
- Trustworth Networks and Services



Figure 18: A moment from the workshop in Canada

Paul Moore of Atos participated representing NextMEDIA and was active in the networking sessions distributing information about NextMEDIA as well as explaining the goals and achievements of the project to Canadian researchers in the area of content and media and the future media internet.

The major outcome of the event was to provide the opportunity to connect researchers from Canada and the EU directly, to explore potential opportunities for collaboration as well as allow these researchers to clearly see what is being done in the other region. For NextMEDIA the major outcome was to increase awareness of the project amongst the Canadian research community. In result, there were contacts that expressed interest in receiving a copy of the deliverable D3.3 Future Media Internet Roadmap.

5.4 FMN-IPTV Workshop in Shanghai

The International Workshop on Future Multimedia Networks and IP-based TV (FMN-IPTV) took place in Shanghai, China on 10-15 April 2011. The workshop focused on the recent disruptions in the future media networks and how these will shape the IP-based television of the future. The workshop was co-organised by NextMEDIA in conjunction with IEEE INFOCOM to provide the community with recent advances in IP video that will impact the media networks of the future.

The main topics of the workshop included

- Content centric network architectures for scalable multimedia content delivery
- Distributed caching in the network for multimedia content
- Search and retrieval of multimedia objects over distributed networks
- Scalable multimedia compression, transmission, concealment
- Network coding and streaming
- Encoding technologies for maintaining the integrity and optimise the quality of experience
- Cross-layer dynamic adaptation and end-to-end QoS issues for heterogeneous networks

- Reputation, trust and incentives in peer-to-peer streaming systems and sensor networks
- Network design impacts of IP-based video convergence
- Architectures for converged systems especially those targeting multi screens and combining mobility
- Video convergence, Mobile TV, Mobile Social TV applications and interactivity
- Video Content Distribution, Networks and P2P architectures for distributed services
- User experience and user experience design
- Innovative methods for evolving IP-based TV services (including algorithmic aspects of computer networking oriented to billing, pricing and advertising models, large-scale data management, etc.)

Organization committee of the workshop is listed below:

Program Chairs

Oscar M Bonastre, University Miguel Hernandez (UMH), Spain
Oscar Mayora, CREATE-NET International Research Center, Italy
Federico Alvarez, Technical University of Madrid (UPM), Spain

Steering Committee

Jon Crowcroft, University of Cambridge, United Kingdom
Pablo Cesar, Centrum Wiskunde & Informatica, Netherlands
Oscar M Bonastre, University Miguel Hernandez, Spain
Theodore Zahariadis, Synelixis, Greece
Petros Daras, CERTH/ITI, Greece
Paul Moore, ATOS Origin, Spain



Figure 19: (from left) Oscar Bonastre (Miguel Hernandez Univ.), Keith Ross (Politecnico NY) and Oscar Mayora (Create-Net) during the INFOCOM Workshop

FMN-IPTV was based on a half-day workshop format, with an opening invited speech, a keynote lecture and two sessions for technical papers. Papers are to be grouped in two themes: (i) Future Media Networks and (ii) IP-based TV. More details about the workshop and accepted papers can be found in Deliverable D4.3.

5.5 3rd Japan-EU Symposium on the “Future Internet”, Finland

NextMEDIA participated to the 3rd Japan-EU Symposium on the "Future Internet", Finland, October 2010. This event has been organized in the past by the European Commission in conjunction with ongoing projects. The previous event was organized in Japan and got together European and Japanese Researchers to discuss about relevant topics and agendas around Future Internet Concept.

6 NextMEDIA Final Workshop

The Final NextMEDIA workshop has been organised within the FIA workshop in Poznan. The decision to bring nextMEDIA final outcomes to the community during the FIA workshop rather than in a separate event has been made based on following reasons:

- NextMEDIA has been strongly involved in participating to the past FIA events
- FIA brings together around 150 research projects and other researchers engaged in Future Internet research which gives us great opportunity to target wide and right audience.
- FIA workshop in Poznan is well timed in the end of the October 2011 (the official last month of the NextMEDIA project).
- The FIA sessions organised by nextMEDIA will have a significant impact on FIA roadmap and further planning of the next FIA events.

The 8th FIA workshop was held in Poznan, Poland on 25-26 October, 2011. All consortium beneficiaries participated to this workshop. The summary of each NextMEDIA organised session is further given in this section. More details about each session can be found in Deliverable D1.2.



Figure 20: A moment of the FIA workshop in Poznan

6.1 Session on “The Future of Networked Media and the Internet: Facts, Reflections and the Road Ahead”

The chair of the session was Paul Moore (Atos) with the shepherd of the Session Christophe Diot (Technicolor). The session has been attended by a wide audience of around 60 people, including the new Head of Unit Net Media Viriol Peca. The session could be followed via live streaming and is still available via VoD.

The session has been divided into several parts where specific areas were dealt, with the perspective of two different speakers respectively, followed by a Q&A session with the audience. The short summary of each presentation is given below.

Introduction

Paul Moore (Atos, Spain) representing the Coordination Action NextMedia presented the different speakers and set the scene.

Architecture

Krzysztof Kurowski (PSNC Poland) and Theodore Zahariadis (Synelixis, Coordinator FIArch Working Group) presented different perspectives on the needs and requirements and future evolution of Future Internet Architecture were presented.

3D

Krzysztof Kurowski (PSNC Poland), and Ebroul Izquierdo (QMUL, Coordinator of NoE 3DLife) examined future scenarios and challenges in the area of 3D.

Connected TV

Ralf Neudel (IRT, Editor “NEM Strategic Research Agenda “) and Federico Alvarez (UPM, Coordinator of NextMedia) focused on portraying the evolving landscape of Connected TV in Europe. A technology overview was presented and the current market situation in Europe explained including a quick outlook on future trends and open challenges in this domain.

Social Media

Oscar Mayora (Create-Net) and Paul Moore (Atos) presented different perspectives on the Social Media and its impact. It is becoming more and more difficult to clearly separate the social networks from the media internet. Google is Google search but it is also Youtube and Google+. Facebook’s goal is to become the gateway to internet media (Spotify and Netflix now available from inside Facebook for example.) Is Daily Motion a social network or a video platform? Social media are rapidly expanding to business media as companies come to realize the power and efficiencies of social media to resolve many of today’s business problems.

Business Models and Wrap-up - Paul Moore (Atos) closed the session with discussions about the Business Models. More and more the question of business models is coming to the fore in any discussion of the Future Media Internet. The battle between Apple, Google, Facebook, Amazon, etc. for the hearts and minds (but especially wallets!) of internauts over the next 10 years is partly a struggle for technological supremacy but just as important will be the struggle for business model supremacy.

The Outcome of the Session

The results of a questionnaire survey were presented, which revealed the fact that Research Challenges such as “*3D content generation leveraging emerging acquisition channels*” and “*Immersive multimedia experiences*” appear to be in the mid-term future interest while “Content with memory and behaviour” is believed to be a challenge in the long-term. In order to support such technologies, the network design has to adapt 3-D content, link different heterogeneous devices and create new models for content distribution involving social and user contextual aspects.

Moreover, bringing rich-media experience to home users, the “Connected TV” conception has to deal with many different challenges in order to become a standard in the TV industry. Hybrid Broadband TV can deliver the specifications to this field of research. Currently, only 3 EU countries are operating the HbbTV technology, while seven more exist which are on a trial or service-announcement phase.

Finally, an extended talk was given for a “Participatory Sensing World” of an IoT network where the Real World and the Online World should be bridged. The huge amount of user data that is available through billions of mobile devices and different social networks, like location, activities, posts to social networks, surroundings environment, behavior etc., can lead to new application scenarios and emerging technologies like management of emergency services, monitor of environment and pollution, healthcare, games and entertainment.

6.2 Session on “Standardisation”

The Standardisation session has been organised by FISA group. As NextMEDIA is a core member of the FISA group, Tomas Piatrik (QMUL) was strongly involved in the organisation of the session and he was also one of the invited speakers. The chair of the session was Franck Le Gall (inno). The audience consisted of around 50 people including industry members of research projects, standardisation organisations, members of European Technology platform and Projects clusters. The workshop was split in 2 parts. The first half contained traditional presentations and a roundtable discussion. The second half focused on interactive discussion and edition of the on-line website.

The main purpose of the session was to:

- Review progresses of the FIA standardisation working group
- Review strategic objectives of the working group
- Debate on the available on-line content
- Suggest next steps

Agenda

Part I: FIA standardisation working group – review of progresses and context evolution

- FIA standardisation WG: review of objectives and progresses, Didier Bourse, (Alcatel-Lucent)
- The Future Networks cluster activities: Key take away, from ETSI Future Networks technologies workshop #2, Gaby Lenhart (ETSI)
- 15 min FI PPP plans for standardization coordination, Mikko Riepula (TivitAalto)
- Interacting with ETPs, Walter Waterfeld from NESSI
- Debate on the role for the standardisation WG, Tomas Piatrik, (QMUL)

Part II: Collective review of on-line content

- Organisation and purpose of web content Lyndon Nixon (STI International)

- Interactive review of website content: fitting presentation to project needs, Jean-Charles Point (JCP Consult)
- Concluding remarks Franck Le Gall (inno)



Figure 21: Franck Le Gall (left) concluding the Standardisation session

The outcome of the Session

The main goal of the session was to answer some important questions related with Future Internet pre-standardisation: what are the good practises and traps to be avoided so as to exploit research results through standardisation activities, what are the foreseen contributions (roadmap) of research projects to pre-standardisation activities, and what interactions should be built at FIA level?

Didier Bourse started the session by recalling the history of the FIA related activities and the general context. He pointed out that in order to be successful, standards need to have the support of the industry and match the timing and needs of the market. The following presentations allowed identifying what pre-standardisation activities permit to explore different pathways, increasing the chances to meet previously defined requirement.

Gaby Lenhart (ETSI) presented the Future Networks cluster activities in ETSI and the ETSI Future Networks Workshop outcome. Jani Kaarlejarvi (Tivit) presented FI PPP plans for standardisation coordination. It was agreed that direct drafting of standards by projects is not the only way to go. There is a need to provide proofs of concept, technical validation and evaluation of testability for developing standards and that test platforms such as the one provided under the FIRE initiative or the upcoming FI-PPP may play a key role in the future. Complementarities with the work set-up by Standard Organisations to welcome research work such as IRTF or ETSI ISG could be seek in that respect and is certainly to study further. Finally it was highlighted that policy requirements are also an important driver to produce standards.

Tomas Piatrik (QMUL) has closed the main part of the session presenting the goals of the FISA group and the road ahead. He highlighted the benefits that community can get from the support group in creating standards. To give an example of the creation process, he presented some existing and recent standardisation groups from NextMEDIA expertise such as IETF CDNI WG and ETSI ISGs. The focus of this part of the presentation has been put on the NextMEDIA proposal on creating the ETSI ISG on Future Internet Architectures. The presentation triggered long discussions from the audience about the role of the standardisation WG and future steps. During these discussions, the need to pursue pre-standardisation related awareness raising actions has been underlined. The objective to rapidly document the situation has been set to the FIA standardisation working group. This mapping exercise needs to be achieved in partnership with projects' clusters and European Technology platform activities. It has been recognised that Future Internet standards are made from a myriad of inputs and that direct contribution from projects is essential to achieve all these goals but also that this could not happen without a business understanding within projects.

6.3 Session on “Architectures”

The session on Architectures was organised by Theodore Zahariadis (Synelixis, Greece), Dimitri Papadimitriou (Alcatel-Lucent, Belgium), Alex Galis (UCL), Bernhard Plattner (ETH, Switzerland), Paul Smith (ULANC, U.K.), Laurent Ciavaglia (Alcatel-Lucent, France), Gerard Nguengang (Thales, France), Panagiotis Demestichas (University of Piraeus, Greece) and Miguel Ponce de Leon (TSSG, Ireland). The topic of the session attracted around 80 researchers and representatives of industry companies or projects.



Figure 22: Some of the Organisers of the Architectures Session during the workshop

The session presented four key architectural aspects for Future Internet (FI) followed by a panel on the key design tasks in FI research and development: FI functional elements; key architectural challenges; main tussles in FI; how to evaluate architecture for FI. The results of this session are planned as a research orientation for the FI design. The four presentations given during the session are summaries as follow:

Design Principles for Future Internet

This presentation will start from the current Design Principles that govern the Internet and analyse which are still valid and are challenged. Then based on the FIArch group work, it will try to analyse and argue which Design Principles should be preserved, which should be modified/adapted to the Future Internet foreseeable needs and which seeds of new principle(s) could govern the next steps towards the Future Internet Architecture. The aim of this presentation is to provide to the FIA community the progress of the FIArch group and collect feedback/comments.

The Importance of Resilience in the Future Internet: Framework, Mechanisms and Experiments

With this increasing dependence on the Internet the consequences of networked service disruption become more significant. The personal and professional life of individuals, the economic viability of businesses and organizations, and the security of nations are directly linked to the resilience, survivability, and dependability of the Global Internet. Ironically, the higher dependence on services renders Internet more vulnerable to problems. Mobile wireless Internet access is more susceptible to the challenges of time-varying, weakly connected channels, and unpredictable delay. The Internet is an increasingly attractive target to recreational crackers, industrial espionage, terrorists, and information warfare. In the same time, it is recognised that the Internet largely relies on isolated tweaks and patches, rather than on coherent systematic approach, to cope with these challenges. In this presentation, we will address this issue and introduce a framework for quantifying the impact of different types of challenges and failures on normal network service operation. Resilience metrics and classes of network resilience and policies to control and increase resilience will be discussed. The outcome should ease the understanding of network engineers about resilient networks and services. The talk will also look into mechanisms and algorithms that should become part of a network infrastructure so that the requirements identified at the framework level are met. We will also describe the currently on-going and planned experiments that eventually will show the viability of our approach.

Management of Future Internet

It is commonly recognized that traditional network management schemes are not the most efficient approach for addressing the complexity associated with the Future Internet. Autonomics, applied in network and services management, appear as the most viable way forward. However, despite the significant research efforts and achievements in this field, the adoption is not yet as widespread as it could be. In this direction, a pragmatic approach is to start by addressing actual manageability problems encountered by operators (this is the approach taken currently by the EC project UniverSelf). The tackling of operators' problems can lead to a Unified Management Framework (UMF). This presentation will provide a concise description of the UMF design in terms of core, reusable and cohesive functional blocks and interfaces, which derive from operator problems and high-level principles and goals, such as the unification/federation of diverse autonomic solutions and technology domains, the governance of autonomic infrastructures and services, as well as the embodiment of autonomic solutions (intelligence) into the management ecosystem. The talk will address the relation of UMF with various legacy network management

standards and emerging concepts like: Self-Organising Networks, Autonomic/Cognitive schemes, etc. The talk will present UMF features that are essential to be present in the Future Networks architecture.

Experiences with Implementing RINA - Recursive Inter Network Architecture

The Internet is only a network of collaborating networks, a concatenation of networks. It is not an efficient inter process communication system as it has missed the key property of layering that early researchers/developers had understood in the late 70's. The Internet sees layering primarily as a means for creating modules within a system. And while it is true, that the concept of layers came from its use in operating systems for this purpose, the use of layers in networks is far more fundamental. The distributed nature of layers in networks creates the major and dominating property not found in a single system “a layer is first and foremost a locus of shared state, of a given scope across multiple systems”. This is why the more we look at the nature of layers in the Internet; the more we find signs that the Internet is a variant of the telephony beads-on-a-string model. It is fundamentally not a layered architecture; it is the DOS of its time. With RINA [we are more interested in investigating an Internet of collaborating networks. RINA adopts the principle that “networking is interprocess communication (IPC) and only IPC”, as all the entities executing in computing systems are processes, networking can be seen as distributed inter-process communication. Although in the Internet for many years, a layer was synonymous with a single data transfer protocol of some form, RINA recognises that it is important to have both network management and layer management.

This talk aimed to raise questions about our knowledge and assumptions of a new modern networking platform, while seamlessly leaving the old Internet intact. It shall also show the many benefits of implementing RINA in a cloud computing environment, which include, bounding router table size, allowing mobility and multicast to scale, and highlight better security and data management.



Figure 23: Dimitri Papadimitriou (Alcatel-Lucent) giving his talk during the session

The outcome of the Session

The Architecture of the FI should be designed by principles which follow Software Engineering rules where the infrastructure embeds intelligence, is programmable and is Software Defined. Current network model relies on uncoordinated internet nodes where the intelligence is located at the ends, so the KISS principle (Keep It Simple, Stupid) should be replaced by the KII (Keep It Intelligent). Moreover, ITU-T Y. Recommendation 3001 has to be met, where “Future Networks” are Service, Content, Data and Environment –Aware. Resilience is another key aspect that FI should follow and in order to achieve this, information among the infrastructure should be shared, rising new issues regarding privacy and energy concerns. This way, trade-offs may need to be made with respect to resilience.

In order to manage and monitor the FI, a Unified Management Framework is been proposed by the UniverSelf Cosnortium. UMF is a framework that will help to produce the unification, governance, and “plug and play” of autonomic networking solutions within existing and future management ecosystems. It includes a repository of guidelines, patterns, models, specification and IT tools to support the development of UMF compliant systems. UMF will have impact on Telecommunication Operators, as it enables the management of complex networks, services and automated processes; to Vendors: as it enables the design of hardware and systems that can easily and quickly being integrated with third-party systems; and to the System Integrators: as it facilitates the integration of new hardware and software elements into the telco operators’ environment.

Next, a recursive approach of using network structures that implement the Inter Process Communication standard, called RINA, was presented which uses recursive layers under the assumption that the ends are relative. There is a separate mechanism from policy which supports multiple functions. Also design principle for complete naming scheme and addressing architecture supports mobility and multihoming. Security, integration of connectionless and connection-oriented networking and separation of port allocation from synchronisation in the transport protocol are principles that the RINA approach uses.

Finally, in this session, participants had the chance to vote and provide feedback to the FIArch group experts regarding crucial questions on Network Design Principles and Challenges. Management took the majority of participants’ votes as the main FI functional element, followed by service awareness and content/data awareness. Functional flexibility/elasticity was voted as the most important key characteristic architectural challenge followed by virtualization of resources and optimization. The main tussle that was pointed by this voting was economics vs functionality vs extensibility.

An interesting discussion took place in the final section which was mainly concentrated on the different issues that need to be addressed during implementation. Security was a concern about the new design principles and how will be implemented in order to protect the network and its privacy. Moreover, will computational resources of low-end devices with limited capabilities be adequate to implement IPC-based, RINA approach? All panelists agreed that advancing from design to implementation phase, will definitely require a lot of time. RINA however is proved to work, under early implementation in test-beds.

It is worth to mention that a Bluetooth voting system was set up, so that each participant could express his/her opinion by voting at one multiple-choice question after the end of each presentation.

6.4 Closing Panel: Future Internet Architectures

The purpose of the session was to analyse which characteristics of the Future Internet Architecture should be fundamental. The Panel moderator of the closing panel was Theodore Zahariadis (Synelixis). He opened the session and introduced 4 invited speakers who presented the Future Internet Architecture from four different points of view:

- Dr. Dimitri Papadimitriou (Alcatel-Lucent) presented his point of view on the Future Internet Architecture, as it is constrained by a network-wide/global-level architecture.
- Dr. Pau (UCLA) considered some networking approaches world-wide (including hints to NSF research) giving emphasis on the pros and cons of evolutionary and revolutionary architectural approaches, and discussed architectural issues regarding mobile services.
- Prof. Müller (TU Kaiserslautern) presented some consideration on the Future Internet Architecture from a Service-Oriented point of view. He introduced today's cloud computing and Future Internet architecture with an emphasis on the Future Internet Architecture as an ecosystem, which includes networks, services, policies, humans....
- Dr. Mohr (Nokia Siemens Networks) presented the Future Internet Architecture requirements from a smart energy point of view, putting emphasis on the mobility requirements (e.g. Future Internet and electric cars).
- A discussion followed on the different architectural issues, not only between the panel participants but also between the participants.



Figure 24: Theodore Zahariadis (Synelxis) (left) together with other invited speakers answering questions from audience

The outcome of the Session:

Dimitri Papadimitriou (ALCATEL-LUCENT) introduced the idea of modularization into the Design Principles of FIArch. While diagnosability, scalability, security, protection, flexibility and evolutivity are design objectives that have not yet been covered, modularization can help in order to circumvent the internet architecture limits. Modularization can provide modules connected by means of realization relationships that supply their behavioral specification. They can also be distinguished between general and specialized modules and can also be dynamically bind at running time

Moreover, Content Centric networks have to rely on a solid FI architecture. Reliability, resilience and trustworthiness are some of the key points that were indicated during the closing session. Giovanni Pau from UCLA proposes to build from scratch and forget IP, while the number of layers needs to be reduced. He focused on specific design principles, mentioning that mobility and security must be built into the architecture and finally discussed the end-to-end principle.

A different approach was presented by Paul Mueller from ICSY. He stated that the problem of current internet is fundamental in the time of creation and that it is hard for new technologies to be implemented into the current technology. The basic idea is to apply Software Engineering methods to design new software architecture for the Internet core. SOA principles should be applied to communication systems. A communication system based on the SOA paradigm includes services that are self-contained, defines explicit interfaces and interaction between elements of the architecture and minimizes assumptions about other services. In general, the dynamically interacting services can replace the concept of layers in current internet.

Werner Mohr from NSN, completed the series of the presentations concerning about energy consumption and device efficiency. In Germany, the integration of the energy network and ICT by means of Future Internet capabilities, services and procedures enables new services and business models. The IT market will push hard the industry and the stakeholders for quick implementation of the first FI capabilities. Smart grid and smart homes are the applications with high requirements and big challenges.

A discussion ended up with this topic which allowed participants to interact with the panelists. Questions about time-schedule of implementation of these design objectives received mixed answers, focusing on Mr Werner Mohr’s answer that by the end of this decade, the Energy System will be integrated with the ICT leading to the first implementation of these goals. Moreover, a conversation regarding complexity of modularization took place, where a participant focused on the impact that will have a modularized system, on simplicity principle.

7 Publications: Proceedings and Journals

NextMEDIA attaches a great importance to the dissemination of research results. It is expected that the results will be published with acknowledgement to nextMEDIA in all publications and other forms of media communication, including media appearances, press releases and conferences.

In the first year NextMEDIA organised 3 special issues listed below:

- MONET Special Issue on Mobility and Media

- Springer Journal on Multimedia Tools: Special Issue on User Centric Media
- IEEE Communications Magazine: Special Issue on Future Media Internet

More details about these special issues can be found in Deliverable D4.3. This section gives an overview of NextMEDIA publications in the second year of the project lifetime.

7.1 Springer Mobile Networks and Applications (MONET) Journal – Special Issue on Mobility and Social Networks Confluence

NextMEDIA is organising the Special Issue in Springer Mobile Networks and Applications (MONET) Journal on Mobility and Social Networks Confluence. Editors of this special issue are Oscar Mayora (CREATE-NET) and Ryoichi Shinkuma.

The journal Mobile Networks and Applications reflects the emerging symbiosis of portable computers and wireless networks, addressing the convergence of mobility, computing and information organization, access and management. In its special issues, the journal places an equal emphasis on various areas of nomadic computing, data management, related software and hardware technologies, and mobile user services, alongside more ‘classical’ topics in wireless and mobile networking. The journal documents practical and theoretical results which make a fundamental contribution.

Submissions deadline: Manuscript submission deadline: March 16th 2012

The Call for Papers for this Special Issue can be found at:
<http://www.springer.com/engineering/signals/journal/11036>

7.2 FIA Books

NextMEDIA beneficiaries were active either as editors of FIA Books or as contributors. Federico Alvarez (UPM), Petros Daras (CERTH) and Theodore Zahariadis (Synelixis) are among the editors (and reviewers) of the book on “Future Internet Assembly 2011: Achievements and Promising Technology”. Full details of the book are given below:

- Domingue, J.; Galis, A.; Gavras, A.; Zahariadis, T.; Lambert, D.; Cleary, F.; Daras, P.; Krco, S.; Müller, H.; Li, M.-S.; Schaffers, H.; Lotz, V.; Alvarez, F.; Stiller, B.; Karnouskos, S.; Avessta, S.; Nilsson, M.: *The book on “Future Internet Assembly 2011: Achievements and Promising Technology”*, published by Springer, Series: Lecture Notes in Computer Science, Vol. 6656, Subseries: Computer Communication Networks and Telecommunications, 1st Edition., 2011, XVI, 465 p.

More information can be found at: <http://www.springer.com/computer/communication+networks/book/978-3-642-20897-3>

The members of nextMEDIA also published the following book chapters:

- “Towards a Future Internet Architecture”, Theodore Zahariadis, Dimitri Papadimitriou, Hannes Tschofenig, Stephan Haller, Petros Daras, George D. Stamoulis, and Manfred Hauswirth
- “Scalable and Adaptable Media Coding Techniques for Future Internet” Naeem Ramzan and Ebroul Izquierdo

- “Semantic Context Inference in Multimedia Search”, Qianni Zhang and Ebroul Izquierdo

Furthermore, Federico Alvarez (UPM) is the main editor for the FIA Book 2012 on “Future Future Internet – From Technological Promises to Reality”. Federico presented the call to the audience during the FIA in Poznan. The call for papers can be found in Annex 5.

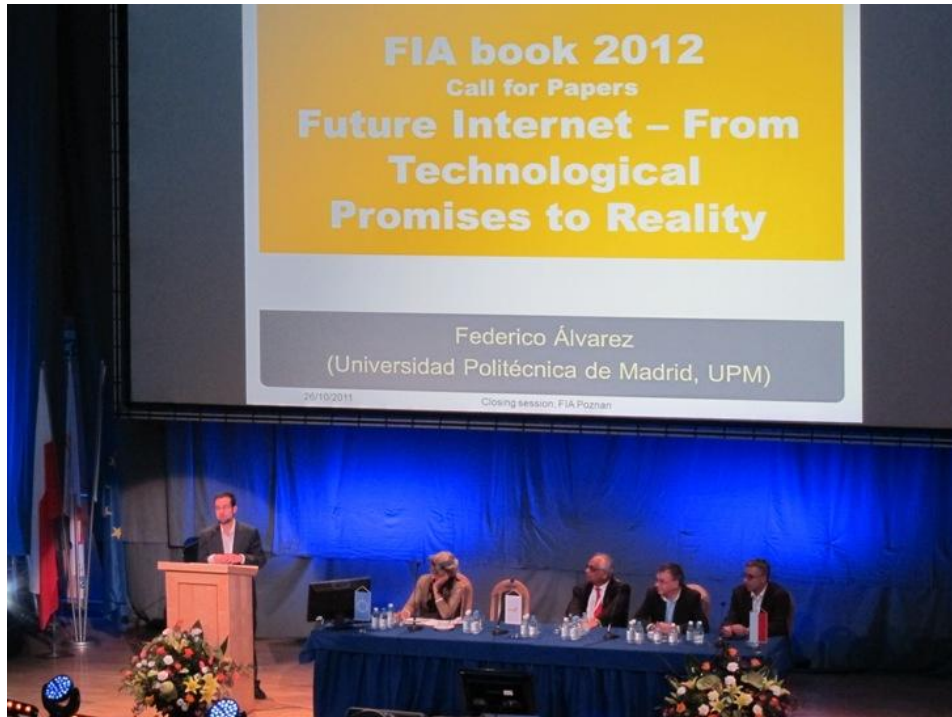


Figure 25: Federico Alvarez (UPM) presenting the FIA book 2012 Call for Papers in FIA Poznan

7.3 White papers and NextMEDIA acknowledged publication

NextMEDIA has contributed to the authoring of following white paper:

- White paper on "Social Networks Overview: Current Trends and Research Challenges", European Commission, Networked Media Unit, Information Society and Media, ISBN 978-92-79-18923-4 doi:10.2759/1559, Nov 2010

Two more white papers are under preparation:

- White paper on “Vision 2020 on Web Applications” to be published in ISBN 2012
- White paper as a result from EU-Japan Workshop

Further, nextMEDIA project has been acknowledged in the following papers:

- Nikolaos Papaoulakis, Charalampos Z. Patrikakis, Christina Androulaki, Lemonia Argyriou, Irene Schmidt “*Distributing real time user generated video over P2P networks*”
- Silvia Uribe, Federico Álvarez and José Manuel Menéndez “*Personalized adaptive media interfaces for multimedia search*”
- Paul Moore and John Soldatos “*Multimedia Search and Retrieval over Integrated Social and Sensor Networks*”

- Theodore Zahariadis, Helen C. Leligou, Panagiotis Trakadas, Mischa Dohler, “Building trust among Virtual Interconnecting Smart Objects in the Future Internet”,
- Naeem Ramzan, Tomas Piatik, Ebroul Izquierdo, “Scalable Video Coding in Networked Environment”.

Finally, NextMEDIA has prepared the report on “Research Challenges, Applications Areas and Business Models” as a result of discussions between experts in the area of media Internet, namely the Future Media Internet – Task Force (FMI-TF).

8 NextMEDIA Standardisation Activities

One of the nextMEDIA goals is to support the creation of the standardisation group in the area of future media internet. Furthermore, nextMEDIA is supporting other FIA projects in their standardisation activities by creating transversal liaison and providing directions to existing pre-standardisation initiatives. This section is giving an update on NextMEDIA standardisation activities during the second year of the project.

8.1 NextMEDIA Support of the Standardisation Group Formation

This section is summarising activities and steps nextMEDIA made in the second year towards supporting formation of the standardisation group, but other following sections are also much related with this task.

ETSI ISG on Future Internet Architectures

First year of the project period brought lots of active discussions regarding the ISG proposal. Gaby Lenhart from Strategy & New Initiatives in ETSI has been involved in discussions and processes aimed to create the group. The final proposal of the ISG name and scope was as follows:

The ISG name: “Towards Future Internet Architectures” with acronym “FIA”

The ISG scope includes:

- define the requirements for Future Internet Architectures,
- design a reference model and the building components of Future Internet Architectures,
- define interoperability, orchestration, communication and self-organisation issues and constrains of Future Internet Architectures resources and systems (networking, computation, storage, content, context), and
- define technologies for content-aware and network-aware caching and multi-source context-aware multimedia streaming.

NextMedia ISG FIA will not include following:

- define business models for Future Internet Architectures,
- define service based architectures and applications,
- define security architectures and security protocols,
- define communication interfaces, ontologies and semantics.

The proposal of the ISG was announced during the FIA Valencia event; however when the group was very close to be launched, ETSI decided not to proceed and give it more time to mature as the industry community was not ready. NextMEDIA decided to look after IETF/IRTF alternatives to launch the standardisation group contacting the chair of the IRTF, but received the similar feedback.

Meanwhile, nextMEDIA have created the FIArch Group (Expert Reference Group) and organised number of FIArch and FMIA-TT meetings and workshops where critical issues on Future Internet Architecture have been discussed. ETSI, noticing nextMEDIA rapid progress in the area, has contacted nextMEDIA beneficiaries and expressed the feeling that the idea is more mature now and ISG may be formed. As the proposal came close to the end of the project lifetime, nextMEDIA beneficiaries after the discussion with PO decided to contact FIA steering board and propose to take over and create the group. The planned discussions about the issue took place during the FIA in Poznan where Tomas Piatrik (QMUL) and Theodore (Synelixis) met with representatives of ETSI, FIA Steering Board members and other industry representatives. The discussions brought mixed feelings and feedback where the majority agreed there is a need for such group, however the lack of industry partners interested in creating it, seems to be the remaining problem. Discussions will continue offline.

IETF CDNI WG

Communication with IRTF chair triggered further discussions between NextMEDIA partners and members of the FIArch group regarding the supporting activities in creation of the standardisation group. As a result, NextMEDIA partners decided to get strongly involved in the upcoming IETF meeting and join the BOF session on Content Centric Networking. The 80th IETF meeting will be held in Prague from 27 March to 1 April together with workshop on Interconnecting Smart Objects with the Internet on 25 March. Theodore Zahariadis (Synelixis) and Tomas Piatrik (QMUL), have actively participated in the discussions during the workshop and made an important contact with IETF beneficiaries. Tomas Piatrik has also attended IETF meeting and participated in the IETF content Delivery Networks Interconnection (CDNI) BoF Session. The CDNI BoF proposed the creation of a group which will standardise how separated Content Delivery Networks (CDN) can interconnect to each other CDNs to enable the delivery of content between the participating CDNs. The interconnection of CDNs means:

- The exchange of content information (meta-data) between CDNs, such as which CDN offers what content and at what conditions (e.g., price, allowed regional distribution)
- Operational information, such as log files
- The exchange of content amongst CDNs
- The request routing amongst CDNs.



Figure 26: The CDNI BoF session chaired by Francois Le Faucheur (Cisco) and Richard Woundy (Comcast)

The session ended with a discussion of the proposed charter which was in large accepted by the attendees. The final step of asking the community if there is support for such an action was positive, i.e., most of the CDNI BOF attendees were in favour of this becoming a WG. NextMEDIA has expressed great interest in helping with shaping the charter of the group and disseminating the group to the wider community. Tomas Piatrik (QMUL) has presented the CDNI group in the Standardisation sessions during both FIA in Budapest and Poznan. Furthermore, NextMEDIA coordinated production of the Internet Draft for this group and has been strongly involved in shaping the document. The CDNI draft has been produced by the Future Media Networks (FMN) cluster of the Networked Media Systems FP7 projects, namely NextMEDIA, ALICANTE, COAST, COMET, ENVISION and OCEAN . The list of contributors can be found below:

- Theodore Zahariadis (editor), Synelixis, Greece;
- Andrzej Beben, Warsaw University of Technology, Poland;
- Christian Timmerer, UNI-KLU, Austria;
- David Florez Rodriguez, Telefonica R&D, Spain;
- David Griffin, Yiannis Psaras, Raul Landa, UCL, UK;
- Daniel Negru, Labri, France;
- Evangelos Pallis, Petros Anapliotis, TEIC, Greece;
- George Xilouris, DEMOKRITOS, Greece;
- Isidro Laso, European Commission, Belgium (on a personal basis);
- Klaus Satzke, Alcatel-Lucent Bell Labs, Germany;
- Michalis Georgiadis, PrimeTel, Cyprus;
- Ning Wang, University of Surrey, UK;
- Spiros Spirou, Intracom Telecom, Greece;
- Yannick Le Louedec, Orange Labs, France;
- Yiping Chen, Daniel Negru, CNRS-LaBRI, France.

Theodore Zahariadis (Synelixis) is an editor of the Draft and he has coordinated this work. The draft is accessible at the following site <http://tools.ietf.org/pdf/draft-fmn-cdni-advanced-use-cases-00.pdf>

8.2 Standardisation monitoring and regulatory implications of Future Media Internet

The goal of this activity is twofold; 1) to identify groups and standardisation areas of interest in other projects, and 2) to monitor/analyse International and European regulatory frameworks in Future Media Internet.

NextMEDIA aims at linking the actions between projects, to establish groups with the same standardisation aims. QMUL produced special questionnaires asking for standardisation actions in different projects and distributed these questionnaires to the attendees of the FIA in Stockholm. During the second year, NextMEDIA continued with this initiative focusing on specific research areas of interest for standardisation in related projects. New version of questionnaires has been created and distributed to the Future Media Networks cluster projects, User Centric Media cluster projects, and networked media community during NEM Summit 2010 and 6th FP7 concertation meeting in Brussels 2010. The details of information received from participations from the survey are summarised in the following table.

	Name	Affiliation	email	Project	Standardisation actions	Research fields for standardisation
1	Erik Fleddens	TNO	Eril.fleddens@tno.nl		IETF, W3C, ETSI	
2	Raul Jimenez	KTH	rauljc@kth.se	P2P-Next	IETF	
3	Pauli Kuosmanen	TIVIT	Pauli.kuosmanen@tivit.si		MPEG, IETF, W3C, ITU, ETSI, IRTF	
4	Jari Ahola	VTT	Jari.ahola@vtt.fi	P2P-NEXT	MPEG, IETF, DVB	Congestion Control, UDB based P2P, P2P for delivery over internet
5	Anolnej Beben	Warsaw university of Technology	abeben@tele.pw.edu.pl	COMET	IETF, ETSI	Content aware routing

6	Wojciech Burakowski	Warsaw university of Technology	wojtek@tele.pw.edu.pl	COMET	IETF, ETSI	Content aware routing
7	Alberto Jose Gonzalez Cela	UPC/i2cat foundation	alberto.jose.gonzalez@upc.edu alberto.jose.gonzalez@i2cat.net	TARIFA	IETF, ISO/IEC	Protocol involved in media signalling and distribution, Media semantic naming
8	Christian Timmerer	Klagenfurt University	christian.timmerer@itec.uni-klu.ac.at	P2P-Next, ALICANTE	IETF, MPEG	MPEG Extensible Middleware (MXM), Advanced IPTV Terminal (AIT), MPEG-V Media Context & Control, MPEG Media Transport (MMT)
9	Ignasio Infantino	CNR	Ignasio.Infantino@cnr.it		IETF	User Interaction and Behaviour, Immersive reality
10	George Pavlou	UCL	g.pavlou@ee.ucl.ac.uk	COMET	IETF, ITU, ETSI	Global naming schemes, Naming and addressing in the Future Internet, Network and content sever awareness (self-management monitoring)
11	Raffaele Bolla	Un. Genoa	Raffaele.Bolla@unige.it		MPEG, IETF, IEEE	
12	Daniel Negru	CNRS Labri	Daniel.negru@labri.fr	ALICANTE	IETF, MPEG, ITU	Architectures for converged networking,

						Content Aware Networks, Content Aware Routing, Streaming Content, Beyond HDTV/electronic cinema, Quality experience
13	Jari Ahola	VTT	Jari.ahola@vtt.fi	P2P-Next	IETF, OVB, MPEG	Content Aware Networks, Streaming Content
14	Fracchia Roberta	Thales Communications	Roberta.fracchia@frthalesgroup.com	OPTIMIX	IETF, MPEG	Streaming Content, Content Filtering, Aggregation, 3D coding, 3D content representation, Beyond HDTV/electronic cinema
15	Saverio Niccolini	NEC EUROPA LTD.	niccolini@neclab.eu	NAPA-WINE	IETF, ALTO, PPSP, DECADE	Architectures for converged networking, Architectures for massive content distribution, Content Aware Networks, Streaming Content, Storage, caching, repositories
16	George Pavlov	UCL	g.pavlou@ce.ucl.ac.uk	COMET	IETF, ETSI	Architectures for converged networking, Architectures for massive content distribution, Content Aware Networks,

						Content Aware Routing
17	David Salama	Atos Origin	David.salama@atosresearch.eu	SARACEN		Metadata, IPTV
18	Tolga Capin	Bilke University	tcapin@cs.bilkent.edu.tr	3DPhone		Architectures for 3D augmented worlds, Rendering of complex scenes, Quality of experience
19	Martha Larson	Delft University of Technology		PETAMEDIA		Content searching, finding and retrieval, Content filtering, aggregation, Optimised searching, Rendering of Complex scenes, Social networking
20	Selinghylin Han	MIRALab, University of Geneva	han@miralab.ch	InterMedia	MPEG	MPEG-4 systems, MPEG-4 widgets, MPEG-V Media Context and Control
21	Stephen Dunne	StarLab	Stephen.dunne@starlab.es	Bramish		Architectures for 3D augmented worlds, Streaming Content, Storage, Caching, repositories, Rendering of Complex Scenes, 3D coding, 3D content representation
22	Gerardo Garcia	Telefonica I+D	gedb@tid.es	Comet		Architectures for massive content

						distribution, Content aware networks, Content aware routing, Content, searching, finding and retrieval
23	Emilio Leonardi	Politecnico Di Torino	leonardi@polito.it	NAPA- WINE		Architectures for converged networking, Streaming content, Storage, caching, repositories
24	Michel Benoit	UCLuvain	Benoit.michel@uclo uvain.be	Apidis	W3C	Architectures for massive content distribution, Content, searching, finding and retrieval, Content filtering and aggregation, Contextual based searching
25	LE LOUEDE C YANNIC K	FRANCE TELECO M	yannick.lelouedec@ orange-ftgroup.com	OCEAN		Architectures for converged networking, Architectures for massive content distribution, Content aware networks, Streaming Content, Storage, caching, repositories

Table 2. Results from standardisation questionnaires asking for research areas of interest

#	Research Area of Interest in Standardisation	hits
1	Streaming Content	7
2	Content aware networks	6
3	Architectures for massive content distribution	5
4	Content searching, finding & retrieval	4
5	Architectures for converged networking	4
6	Content aware routing	3
7	Content Filtering, aggregation	3
8	Storage, caching, repositories	3
9	Architectures for 3D augmented worlds	2
10	Contextual based Searching	2
11	Rendering of complex scenes	2
12	3D coding	2
13	3D content representation	2
14	Beyond HDTV /electronic cinema	2
15	Quality of experience	2
16	Optimised searching	1
17	Social Networking	1
18	Multi view point coding	0

Table 3. Summary of research interests for standardisation.

The nextMEDIA questionnaire can be found in Annex 2. The responses show that there is a great fragmentation not only at the areas that various projects aim to contribute, but also to the standardization bodies that various projects target.

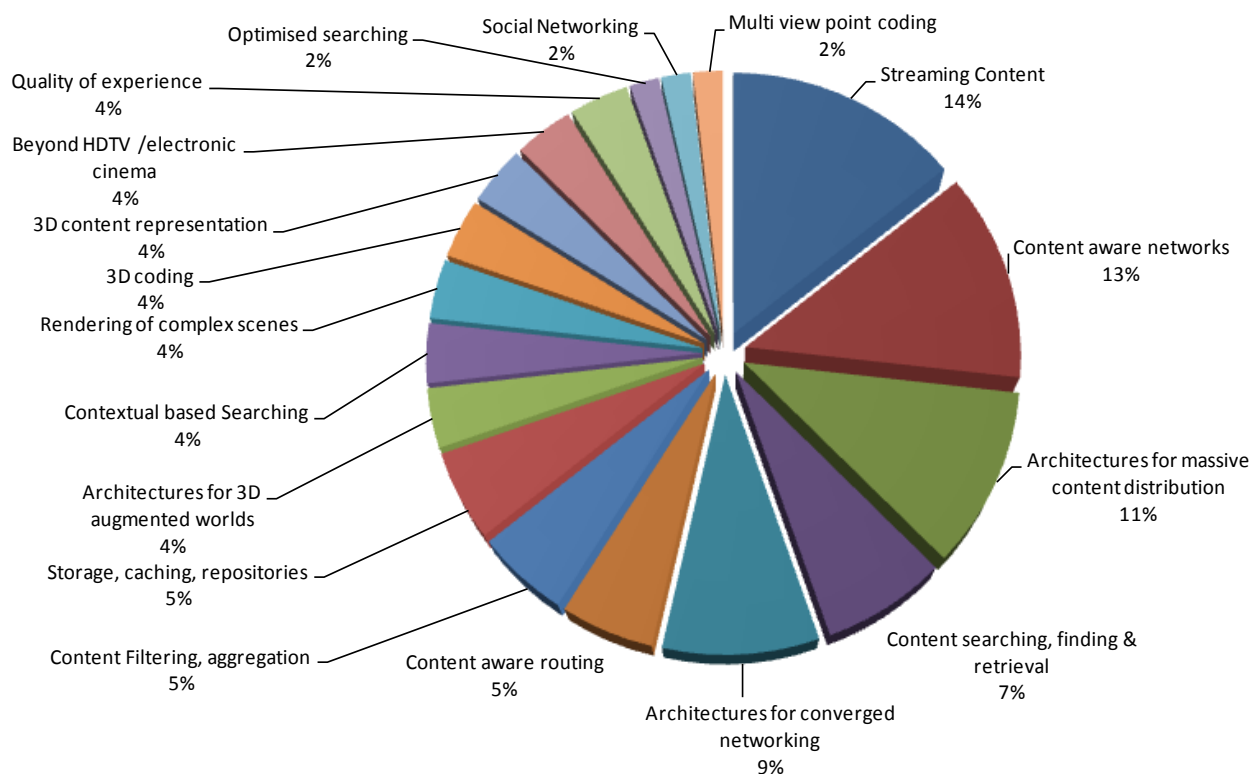


Figure 27: Research area of interest in Standardisation

As it is shown in Figure 27, there are many research areas in which projects are aiming to contribute to standards. Among them, Streaming Content has received the highest score (14%) followed by Content Aware Networks (13%), Architectures for Massive content distribution (11%), Architectures for Converged Networks (9%) and Content Searching and Retrieval (7%). More specific areas received lower marks (e.g. Content aware routing received just 5%).

Moreover the projects interest towards various standardization bodies is also fragmented. As shown in Figure 28, IETF is the standardisation body that receives the interest of most projects (32%) followed by ETSI (21%) and MPEG (19%). This may be due to the fact that IETF is an international standardization body (while for instance ETSI is European) and there is no fee for being a member or submitting an Internet draft. Another reason may be that IETF is targeted to Internet protocols, while the other standardization bodies have a broader scope.

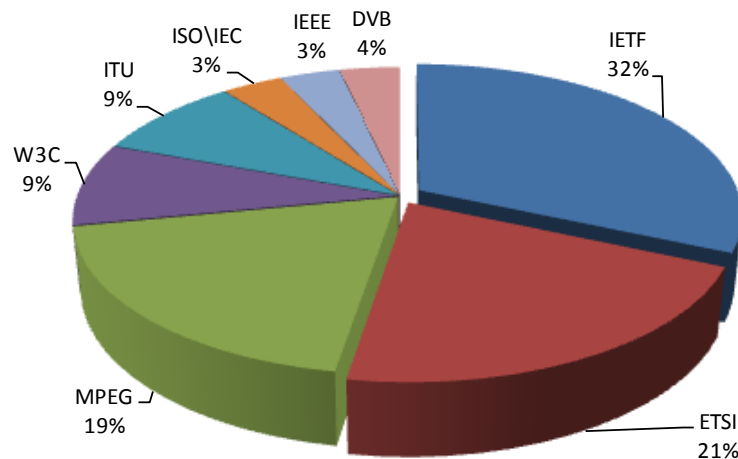


Figure 28: Targeted Standardisation Bodies

On the other hand, in order to further coordinate contributions to standardization bodies, we have grouped the areas of research which could lead to standardization activities and concluded to Figure 29. There it is shown that various architectural issues receive the highest interest (25%) followed by the Streaming Content & Content Aware Routing (21%) and Content Aware Networks & Caching (19%).

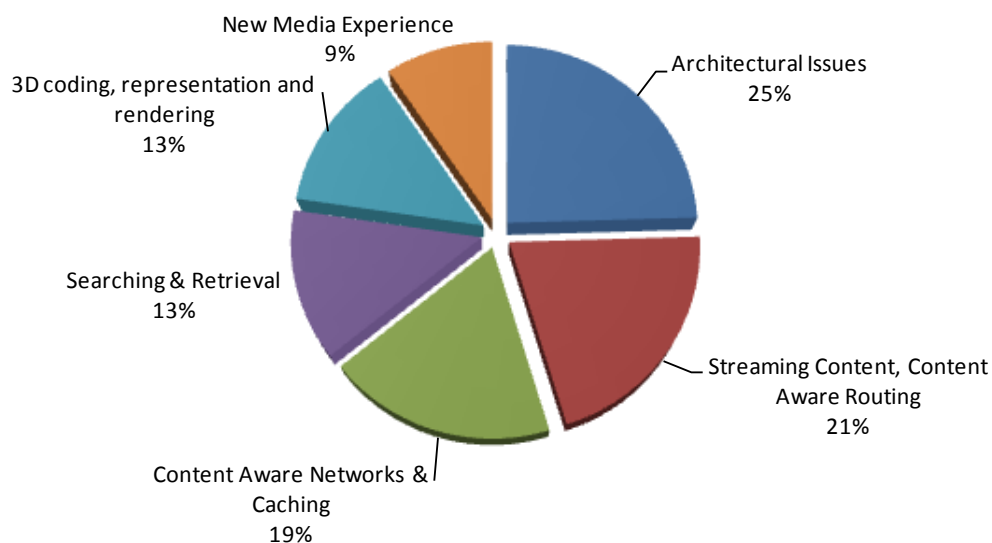


Figure 29: Grouping of research area of interest in Standardisation

Resulting research of interests in Standardisation has been presented during Standardisation session in FIA events in Budapest and Poznan, as a part of the FISA initiative. Presentation received very positive feedback and organisers of the session together with representatives from the industry sector supported this activity in order to understand the need and interests of EU projects in standardisation.

During the second year, nextMEDIA continued with following the progress of standardisation bodies, IETF (/W3C) IETF/IRTF, ETSI and MPEG, on a regular basis by joining the email reflectors and monitoring ongoing activities. QMUL is member of MPEG in Scalable Video Coding Group. Furthermore, QMUL hosted 89th MPEG meeting in London on 3rd July 2009 where objectives of upcoming NextMedia project were promoted. QMUL and CERTH are following MPEG activities in the field of Future Internet (specifically SVC, MPEG7, MPEG21, JPSearch) and Synelxis is taking over IETF (P2P, ALTO, ROLL) and ETSI (DVB) standardisation activities in the relevant sectors. Detailed analysis of the European participation and contribution to IETF can be found at Annex 4.

The outcome of the activity has been used for creating the documents on Standardisation activities (see Annex 8) and Standards organisation identification (see Annex 9). QMUL together with CERTH worked together during the last quarter of the second year to update these documents with IETF/IRTF, MPEG and IEEE recent activities.

8.3 FIA Standardisation Support Group

NextMEDIA is a member of the “standardisation community” within the FIA, which groups seven coordination projects under FP7. The flyer of the group can be found in the Annex 6. The objective of this group is to define a shared action plan to support standardisation activities within the FIA and help FIA projects in their standardisation activities. QMUL is leading this activity and actively participating in teleconferences where beneficiaries discuss about the roadmap and further action plans. NextMEDIA is helping with creating dissemination materials of the group, providing links to standardisation bodies, and relevant materials to the FIA projects and identifying the roadmap. Through the support group, nextMEDIA increases the efficiency of R&D projects standardisation activities by

- Providing direction to existing pre-standardisation initiatives
- Creating transversal liaison between FIA communities and projects
- Identifying and advertising existing and foreseen standardisation activities.
- Encouraging cooperation and building synergies in FIA activities
- Facilitating the dissemination of project results to wider community, particularly industry

The FISA group has organised Standardisation sessions during the FIA events in Budapest and Poznan and had a slot during the FIA Workshop and Standardisation Workshop in Ghent on 15-17 Dec. 2010. The FISA poster prepared for this event can be found in Annex 7. More details about the Standardisation workshop can be found in Section 4.2. Outcomes of the Standardisation sessions during FIA events are summaries below:

FISA Standardisation session during FIA in Budapest

The session focused on the issue of pre-standardisation, which is the main interest of most R&D European projects; standard bodies have identified this need well by creating pre-standard or incubator groups within their structure. The session tried to answer some questions related to Future Internet pre-standardisation: how to increase the contribution of research projects to the pre-standardisation process, what should be pre-standardised in the short term, where and in which timeframe?

The main organisation addressing to Future Internet issue is IRTF; as examples, ETSI has recently successfully set-up ISGs; ITU and W3C have created focus groups / incubator groups. The purpose of the session was to identify a number of pre-standardisation topics in the area of Future Internet that are general enough to attract many industrial participants and yet strict enough to come out with pre-standards in a reasonable time. In order to reach this goal, the session first reminded the different paths to technology adoption through pre-standardisation and then looked at operational and pragmatic approaches increasing the contribution of research to valuable (pre)standards. After this, a number of candidate pre-standardisation topics have been presented, coming from the FIA community. Didier Bourse first pointed out that in order to be successful, standards need to have the support of industry and match the timing and needs of the market. The following presentations allowed identifying that pre-standardisation activities permit to explore different pathways, so increasing chances to meet the previously defined requirement. The work of Flarch on Future Internet architecture was presented by Dimitri Papadimitriou; he required the collaboration of the different FI areas to successfully define a generic architecture. Before initiating the panel session Henrik Abramowicz reminded general observations for a standardisation process to be successful.

During panel, the need to clearly identify what is meant by Future Internet standardisation has been questioned and no consensus was obtained. While the majority of panellists were thinking that this would be a lengthy and inefficient effort, Alex Gallis defended the need to clearly differentiate the Current Internet from the Future one and advocated the classification efforts having been made in ITU. Tomas Piatrik (QMUL) has presented nextMEDIA role in the FISA support group and underline nextMEDIA achievements in FIA sector, including all nextMEDIA organized Working discussions groups. Furthermore, he presented NextMEDIA analysis results of interests in standardization from the project in Networked Media sector. The conclusions from the closing panel identified the pre-standardisation tracks that should be the main focus for the further collaboration.

FISA Standardisation session during FIA in Poznan

The main goal of the session was to answer important questions related to Future Internet pre-standardisation: what are the good practises and traps to be avoided so as to exploit research results through standardisation activities, what are the foreseen contributions (roadmap) of research projects to pre-standardisation activities, and what interactions should be built at FIA level?

During the session, Didier Bourse recalled the history of the FIA related activities and the general context. He pointed out that in order to be successful, standards need to have the support of industry and match the timing and needs of the market. Gaby Lenhart (ETSI) presented the Future Networks cluster activities in ETSI and the outcome of the ETSI Future Networks Workshop. Jani Kaarlejarvi (Tivit) presented FI PPP plans for standardisation coordination. Complementarities with the work set-up by Standard Organisations to welcome research work such as IRTF or ETSI ISG could be seek in that respect and is certainly to study further. Finally it was highlighted policy requirements are also an important driver to produce standards. Tomas Piatrik (QMUL) has closed the main part of the session presenting the goals of the FISA group and the road ahead. He highlighted the benefits that community can get from the support group in creating standards. Further, he presented IETF CDNI WG. The focus of this part of the presentation has been put on the NextMEDIA proposal on creating the ETSI ISG on Future Internet Architectures. The presentation triggered long discussions from the audience about the role of the standardisation WG and future steps.

9 Conclusions

NextMEDIA dissemination activities during the second year have been presented in this deliverable, covering as main aspects:

- dissemination to the general public, through the nextMEDIA website,
- spreading project activities during exhibitions and workshops using leaflets, posters and presentations,
- publishing and distributing biannually newsletter via email lists and during nextMEDIA related events,
- technical disseminating through scientific journals, conferences and workshops.

As it is described through this Deliverable, NextMEDIA has organized a number of coordinated forums for promoting and positioning European research and industry at an International level in a systematic way. Furthermore, NextMEDIA provided ongoing European projects and Institutions with dedicated forums such as special tracks in conferences, Journal special issues and collaboration events to promote their results and approaches on Future Media Internet topics. This activity is helping EU projects to disseminate and promote their work in a coordinated way through dedicated events and publications, thus maximizing their impact. NextMEDIA standardisation activities include supporting of the standardisation group, monitoring and analysing International and European frameworks and supporting projects in standardisation. During the second year of the project, nextMEDIA has coordinated production of the IETF CDNI Internet Draft. NextMEDIA also analysed research interests in projects related to Future Media Internet and participated in creating the guide documents to help project with pre-standardisation as a part of the FISA support group.

ANNEX 1: NextMEDIA Dissemination Materials



NEXTMEDIA
future media internet

**Time to move on
and leave the boring past...**

The Media Internet supports professional and novice content prosumers and is at the crossroads of digital multimedia content and Internet technologies. It encompasses two main aspects: Media being delivered through Internet networking technologies (including hybrid technologies) and Media being generated, consumed, shared and experienced on the web. The Media Internet is evolving to support novel user experiences such as immersive environments including sensorial experiences beyond video and audio (engaging all the human senses) that are adaptable to the user, the networks and the services.

Coordinating and supporting activities towards strengthening the European position in Future Media Internet. Specifically:

- Creating a new "Future Media Internet Architecture" Think Tank to reinforce the leadership of the EU in this field.
- Coordinating initiatives organized by the EC, including "Future Media & 3D Internet Task Force" and the "Future Content Networks" group.

Structuring the Future Media Internet research evolution path by:

- Join standardisation efforts of European research projects
- Organising the existing knowledge in a unified form and comparing the research situation in Europe with other areas of the world: Japan, USA, Korea, China, etc. to elaborate a research roadmap
- Coordinating efforts of European projects in media, by collecting and analyzing the short and long term implications and priorities
- Promoting the results of the European research inside and outside Europe

Visit our web page: www.fi-nextMedia.eu

Editor contacts:
Tomas Piatrik (QMUL/MMV) <tomas.piatrik@elec.qmul.ac.uk>
Federico Alvarez (UPM) <fag@gatv.ssr.upm.es>

EU Research Project FP7-ICT-249065

Partners:


POLITÉCNICA


Atos Origin


Queen Mary University of London
MMV
Multimedia and Visual Research Group


INFORMATICS & TELEMATICS INSTITUTE


CREATE-NET


SYNELIXIS

Figure 30: NextMedia Leaflet (version 1)





NEXTMEDIA
future media internet



Participate in our activities!

Different Think Tanks, Task Forces and groups. Fill in our participation forms!
You have several options to choose:

“Future Media Internet Architecture” Think Tank: a living think tank in Europe for defining the Future Media Internet architecture. Successful paradigms will be exhaustively analysed (e.g. the AKARI project in Japan, the FI project in Korea, the NetSE project in the USA) and the European position on this area will be recorded.

“Future Media Internet Task Force”: The Task-Force, after numerous discussions, meetings, phone-calls, brainstorming and workshops, has recently published the White Paper: “Research on Future Media and 3D Internet” (Nov. 2008). nextMEDIA aims at continuing the successful work that is carried out by this TF.

“Future Content Networks” group: A Future Internet will be driven by new demands. Content delivery is one area where the current Internet has proven its transport capability but has not shown that it could deal with content in any sensible way. Such network capability, provided in a reliable and cost-effective manner, would directly contribute to the competitiveness of the European economy.

- Help in the elaboration of a **Future Media Internet international roadmap**, structuring the Future Media Internet research evolution path, analysing the situation, technology and patents in the most developed countries in relevant research areas.
- Standardise your research results by participating in the **ETSI Industry Specification Group (ISG) on Future Media Internet**.
- Participate in **top-notch events, forums, leading Conferences and scientific Journals, exhibition events, talent support and more... organised by nextMEDIA**

You can receive all the latest information by subscribing to our mailing list!
Visit our web page: www.fi-nextMedia.eu

“Shaping and coordinating the Future Media Internet”

Editor contacts:
Tomas Piatrik (QMUL/MMV) <tomas.piatrik@elec.qmul.ac.uk>
Federico Alvarez (UPM) <fag@gatv.ssr.upm.es>



EU Research Project FP7-ICT-249065

Partners:



POLITÉCNICA



Atos Origin



Queen Mary
University of London
MMV
Multimedia and Vision Research Group



INFORMATICS & TELEMATICS INSTITUTE
Universitat Politècnica de Catalunya



CREATE-NET



SYNELIX

Figure 31: NextMedia Leaflet (version 2)

NEXTMEDIA
future media internet

"Shaping and coordinating the Future Media Internet"

The Media Internet supports professional and novice content prosumers and is at the crossroads of digital multimedia content and Internet technologies. It encompasses two main aspects: Media being delivered through Internet networking technologies (including hybrid technologies) and Media being generated, consumed, shared and experienced on the web. The Media Internet is evolving to support novel user experiences such as immersive environments including sensorial experiences beyond video and audio (engaging all the human senses) that are adaptable to the user, the networks and the services.

Coordinating and supporting activities towards strengthening the European position in Future Media Internet. Specifically:

- Creating a new "Future Media Internet Architecture" Think Tank to reinforce the leadership of the EU in this field.
- Coordinating initiatives organised by the EC, including "Future Media & 3D Internet Task Force" and the "Future Content Networks" group.

Partners:

Structuring the Future Media Internet research evolution path by:

- Join standardisation efforts of European research projects
- Organising the existing knowledge in a unified form and comparing the research situation in Europe with other areas of the world: Japan, USA, Korea, China, etc. to elaborate a research roadmap
- Coordinating efforts of European projects in media, by collecting and analysing the short and long term implications and priorities
- Promoting the results of the European research inside and outside Europe

Visit our web page: www.fi-nextMedia.eu

EU Research Project FP7-ICT-249065

Figure 32: NextMEDIA Poster



Content:
Welcome Note
NextMedia Discussion/Working Groups
FIA in Ghent, 2010
80th IETF meeting in Prague, 2011
Analysis results from Concertation meetings
Publications and Upcoming Events
www.fi-nextMedia.eu

Issue 3
April, 2011

3



os (EC) giving his talk during the FIA workshop.

chitectural component” BO session:

ext	Loretta Anania (EC - DG INFSO)
ctural	Francesco Nucci (Engineering)
g for a	
ch	Ricardo Baeza-Yates (Yahoo!)
ent	Alexis Joly (INRIA)
	Moderator: L. Anania (EC - DG INFSO)
	Panel:
	R. Baeza-Yates (Yahoo!)
	F. Nucci (Engineering)
	A. Joly (INRIA)
	J. Domingue (Open University)
ion	Loretta Anania (EC - DG INFSO)



Standing from left: Theodore Zahariadis (Synelxis), Isidro Laso Ballesteros (EC) and Dimitri Papadimitriou (Alcatel-Lucent) during the open discussion in FIA workshop.

EU Research Project FP7-ICT-249065

Figure 33: NextMEDIA Newsletter

ANNEX 2: Questionnaire on Research Orientation and Standardisation Focus

Networked Media Research Orientations & Standardization Focus

Targeting better coordination of existing and forthcoming research challenges in the EC Networked Media Unit and larger impact, with this questionnaire, the nextMedia CA aims to:

1. Identify common initiatives for standardization across different projects
2. Identify topics that are relevant for different projects for workshops and special issues for journals.

You cordially invited to complete the following questionnaire or provide the information on-line on the nextMedia web site: www.fi-nextmedia.eu

Name: Company:.....

Email:

Project Name: Instrument
(IP/STREP/NoE/CSA):

Accepted at Call:..... Start Date:..... End Date:.....

Standardization

Q1: Do you consider submitting a contribution to a standardization body?

Please complete with “Yes” or “Maybe” wherever applicable:

Research Area of interest		Within the following months					
		6	12	18	24	30	>30
1	Architectures for converged networking						
2	Architectures for massive content distribution						
3	Architectures for 3D augmented worlds						
4	Content aware networks						
5	Content aware routing						
6	Streaming Content						
7	Storage, caching, repositories						
8	Content searching, finding & retrieval						
9	Content Filtering, aggregation						
10	Optimised searching						
11	Contextual based Searching						
12	Rendering of complex scenes						
13	Multi view point coding						
14	3D coding						
15	3D content representation						
16	Beyond HDTV /electronic cinema						

17	Social Networking						
18	Quality of experience						
19	Other (Please specify)						

Q2: Do you think that there is a standardization body/WG targeting the research area(s) that you are interested in?

Ref. Number of the Research Area	No (No Standardization body targets this Research Area)	I don't know	Yes (Please specify)

Q3: Has your project pre-allocated effort/money for standardization?

☐ Yes ☐ No

Q4: You would prefer to contribute to a standardization body with:

☐ No membership fees ☐ Membership fees ☐ Does not matter

Q5: Would you continue contributing to that standardization body after the end of the project?

	Ref. Number of the Research Area							
No								
Yes								
Conditional. Based on.....								
Project Results								
Standardization Evolution								
Market Evolution								
Company's Exploitation plan								
Project Continuation								
Standardization Body Fees								
Other								

Q6: In which research areas you would prefer:

	Ref. Number of the Research Area
--	----------------------------------

Standardization									
International Patent									
National Patent									
Journal Publication									
Conference Publication									

Dissemination

Q7: Do you consider submitting a paper to a conference/workshop/journal/magazine?

Please complete with “Yes” or “Maybe” wherever applicable:

Research Area of interest		Within the following months					
		6	12	18	24	30	>30
1	Architectures for converged networking						
2	Architectures for massive content distribution						
3	Architectures for 3D augmented worlds						
4	Content aware networks						
5	Content aware routing						
6	Streaming Content						
7	Storage, caching, repositories						
8	Content searching, finding & retrieval						
9	Content Filtering, aggregation						
10	Optimised searching						
11	Contextual based Searching						
12	Rendering of complex scenes						
13	Multi view point coding						
14	3D coding						
15	3D content representation						
16	Beyond HDTV /electronic cinema						
17	Social Networking						
18	Quality of experience						
19	Other (Please specify)						
20	Other (Please specify)						

Q8: Do you think that there are conferences/workshops targeting the research area(s) you are interested in?

Ref. Number of the Area	No	I don't know	Yes (Please specify)

--	--	--	--

Q9: Do you think that there are journals/magazines targeting the research area(s) you are interested in?

Ref. Number of the Area	No	I don't know	Yes (Please specify)

Q10: Has your project pre-allocated effort/money for dissemination?

☐ Yes ☐ No

Q11: Would you prefer to disseminate at:

	Ref. Number of the Research Area									
Event										
Exhibition										
Conference										
Workshop in parallel to a conference										
Media (Radio/TV)										
Newspaper										
Journal										
Magazine										
Special Issue of a Magazine										
FIA Book										
White Paper										
Other										

Q12: Would you or a researcher from your project/company be interested to serve as TPC member in a conference/workshop (such as SIGCOMM, INFOCOM, ICASSP, ICIP) or special issue in journal?

☐ Yes ☐ No

Name	Company	Email	Project	Event/Journal

ANNEX 3: Analysis of Research Orientation in the EC Networked Media Unit

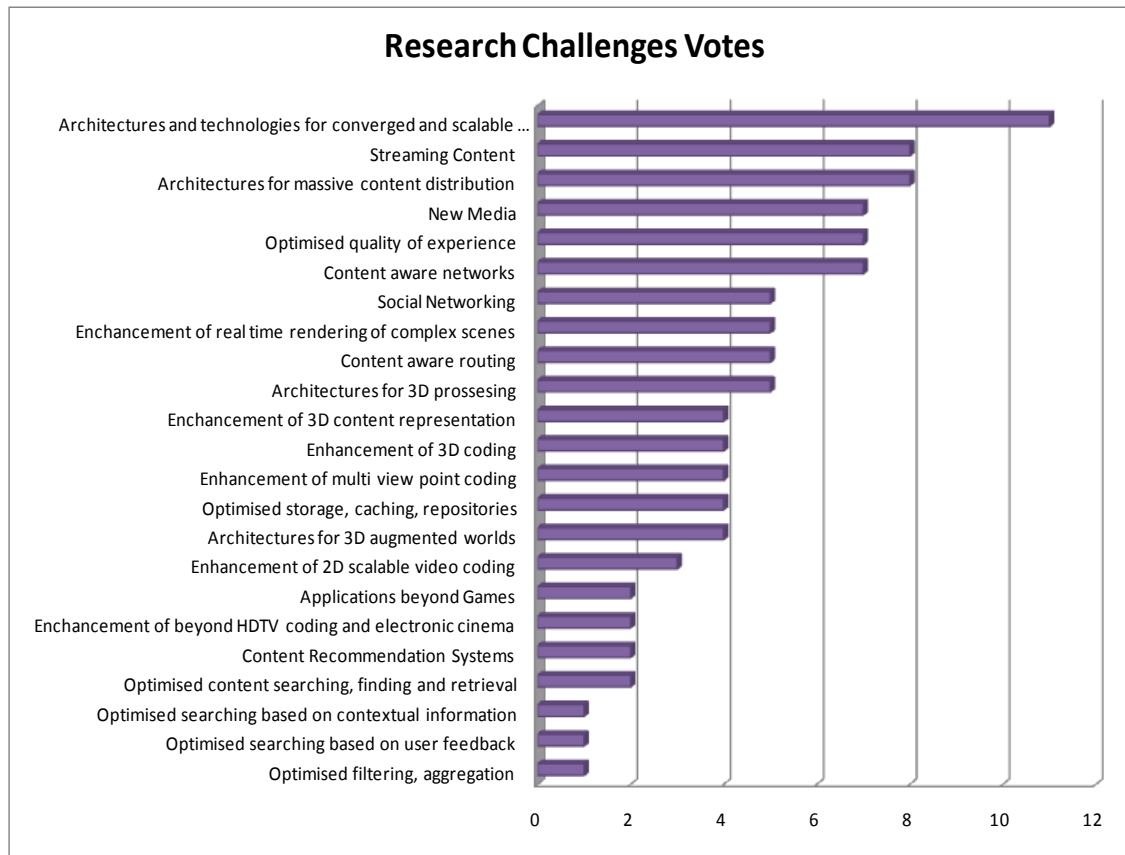


Figure 34: Research Challenges Votes on the Questionnaire

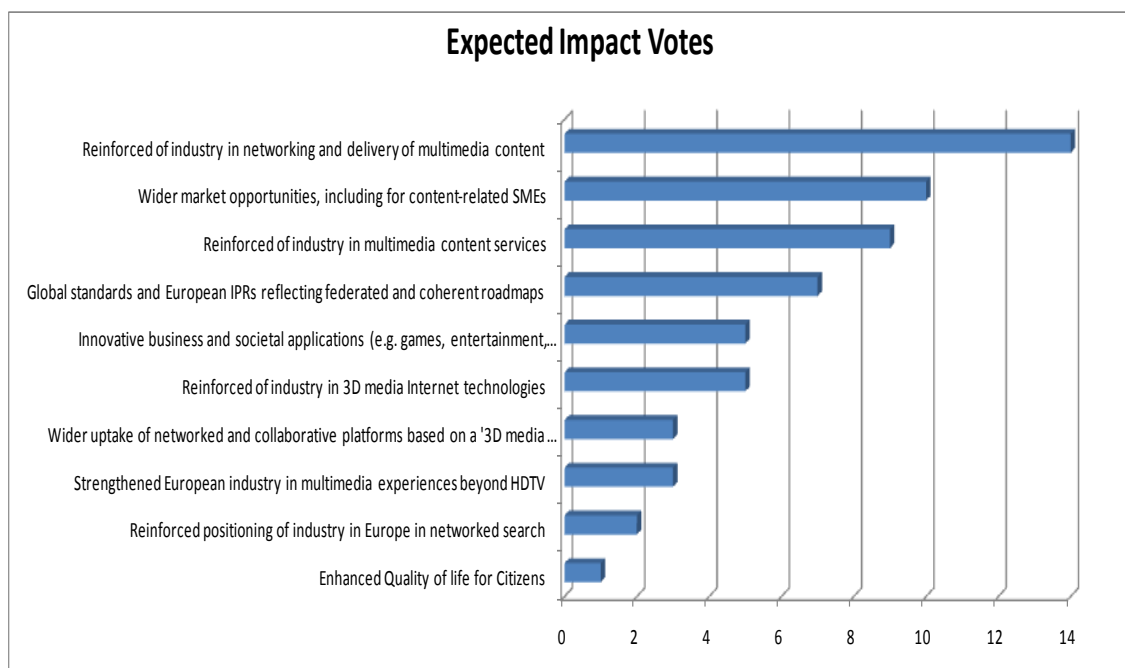


Figure 35: Expected Impact Votes on the Questionnaire

From the analysis of the results (Figure 34:), we see that a large number of projects are in one way or another associated with the topic “Architectures and technologies for converged and scalable networking” (10 projects), followed by the “Architectures for massive content distribution” and the “Content Streaming” topics (8 projects). “Content Aware Networks”, “Optimised Quality of experience” and “New Media” follow with 7 representing projects.

As “Expected project impact” from the projects (Figure 35:4), the most popular reply was “Reinforced of industry in networking and delivery of multimedia content,” with 14 votes, followed by “Wider market opportunities, including for content-related SMEs” with 10 votes and “Reinforced of industry in multimedia content services” with 9 votes.

ANNEX 4: Analysis of EU projects and industry participation in IETF

NextMedia has started to analyse the European participation and contribution to IETF. As it may be seen in Annex II (Section **¡Error! No se encuentra el origen de la referencia.**), Cisco is by far dominating the RFCs (~290 authors). At the second position would be the combination of Alcatel, Lucent and Bell-labs (all together ~120), followed by IBM (~100), Microsoft (~80), BBN (~79) and Ericsson (~77). Moreover overall, US owns the majority of the accepted Request For Comments (RFC) documents (with 900), while Europe follows (with 720). However, if we consider that Europe started contributing after 1987, then we can see that Europe’s contribution the last couple of years is really significant.

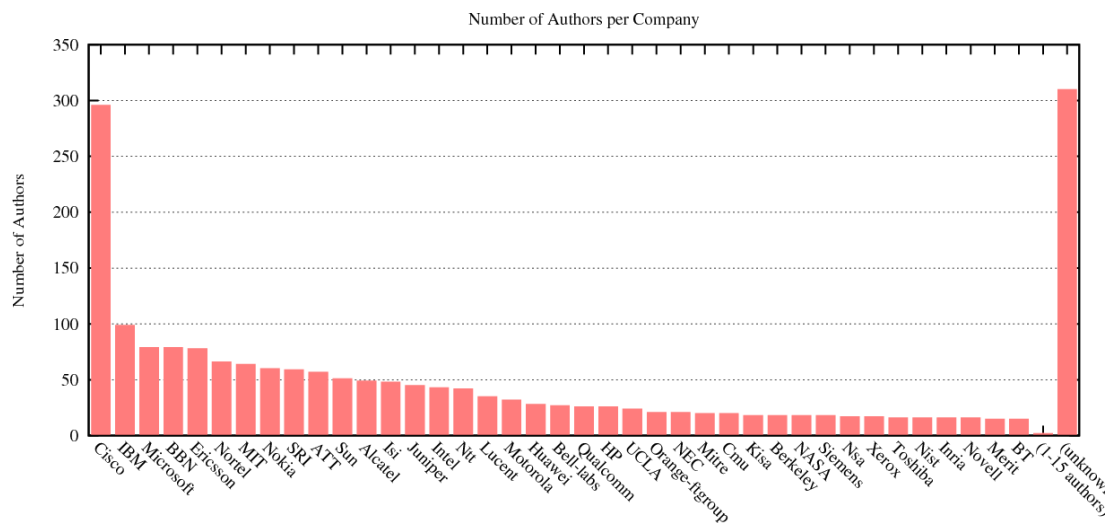


Figure 36: Number of Authors per Company

Cisco is by far dominating the RFCs (~290 authors). At the second position would be the combination of Alcatel, Lucent and Bell-labs (all together ~120), followed by IBM (~100), Microsoft (~80), BBN (~79) and Ericsson (~77).

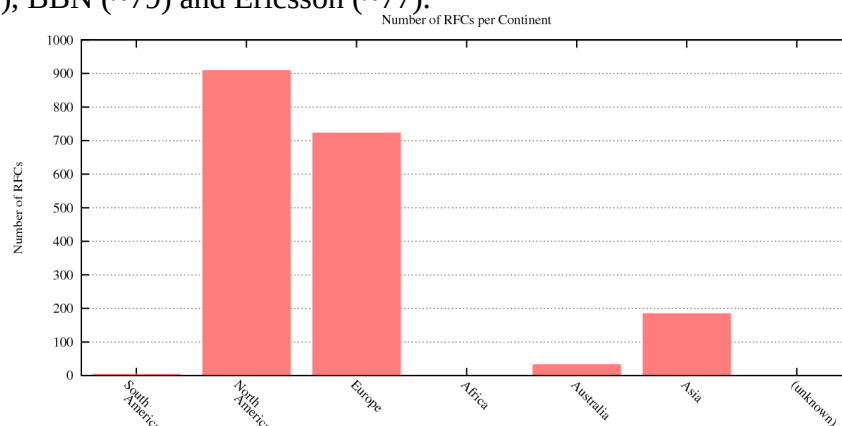


Figure 37: Number of RFCs per continent

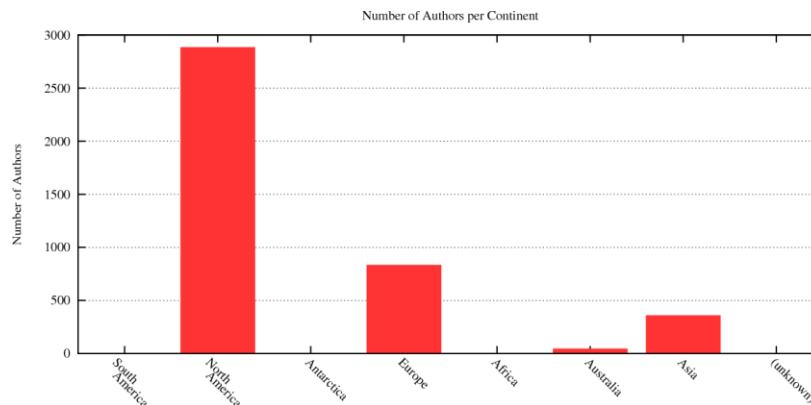


Figure 38: Number of RFC Authors per continent

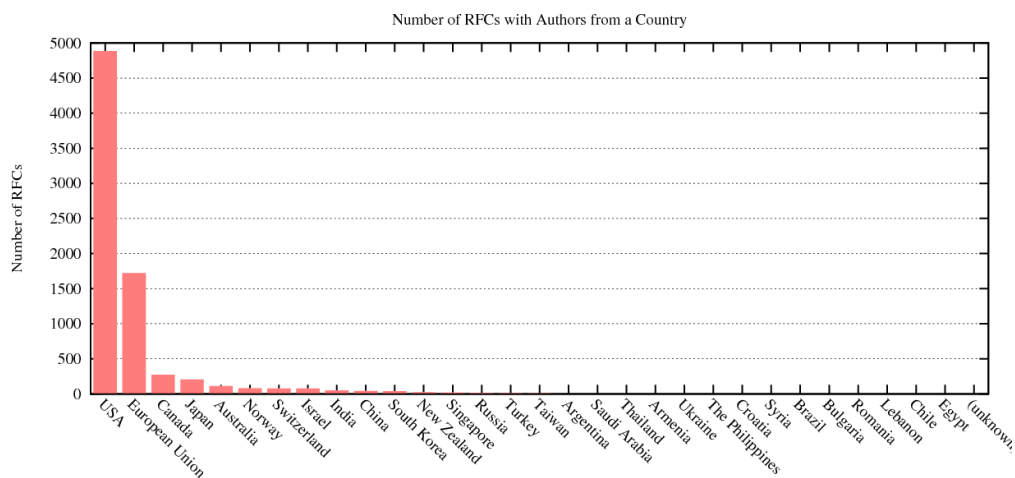


Figure 39: Number of RFCs (Considering EU as a single country)

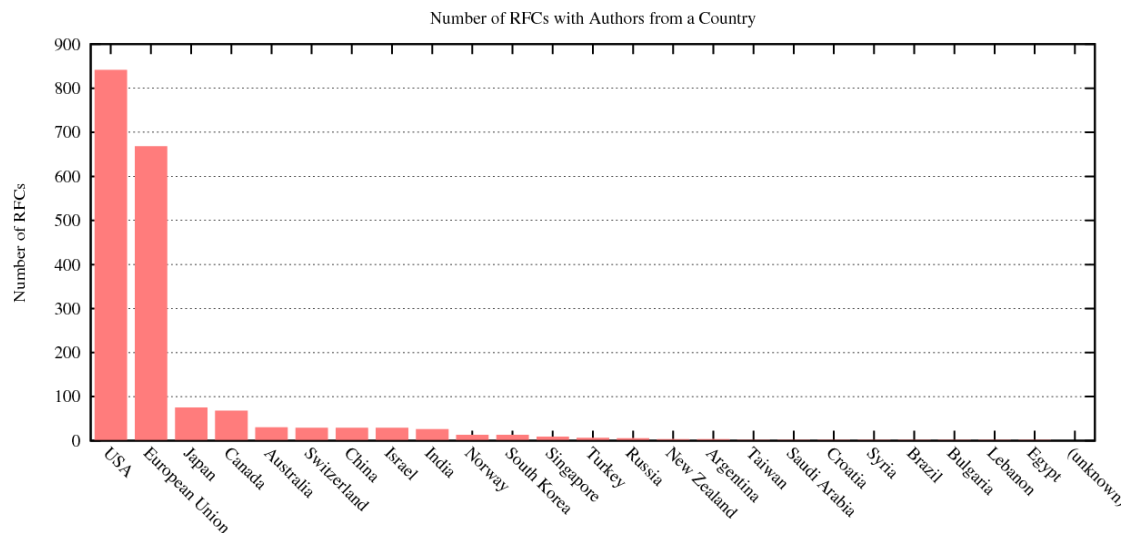


Figure 40: Number of recent RFCs (Considering EU as a single country)

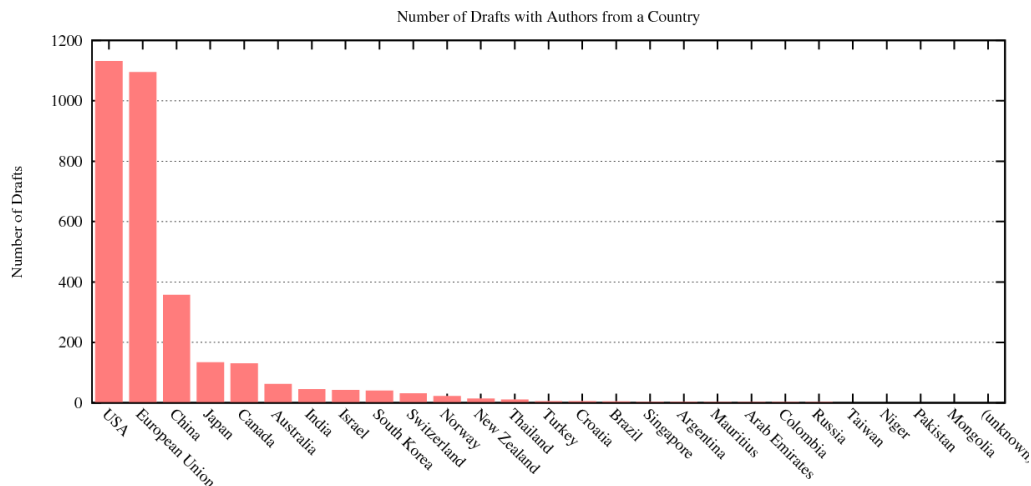


Figure 41: Number of IETF drafts (Considering EU as a single country)

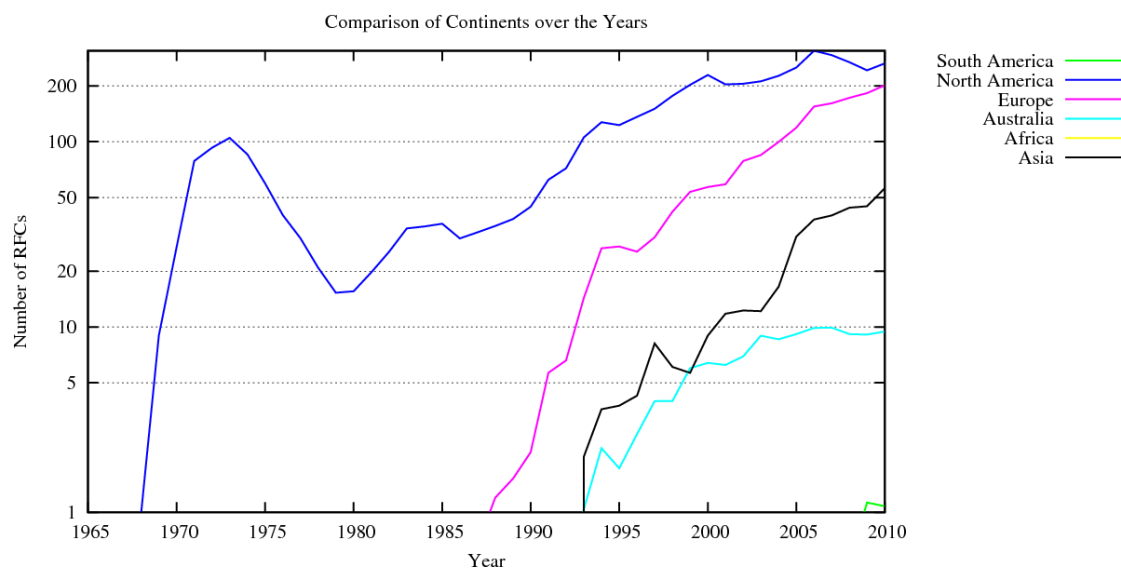


Figure 42: Comparison of continents over the Years

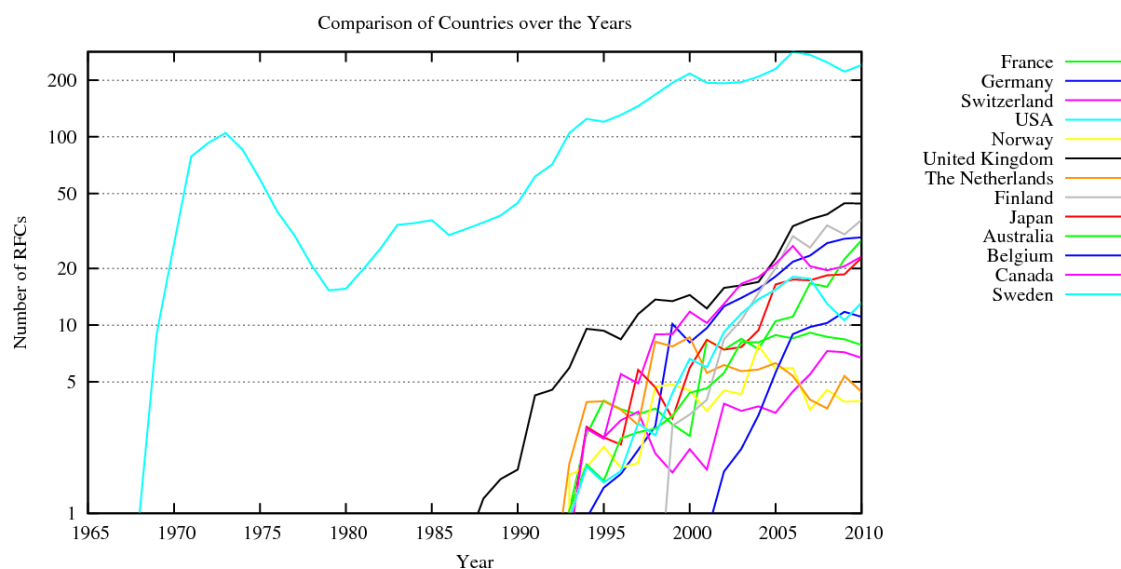


Figure 43: Comparison of countries over the Years

APPLICATIONS AREA	ALEXEY MELNIKOV (UK) <ALEXEY.MELNIKOV@ISODE.COM>	PETER SAINT-ANDRE (CISCO) <STPETER@STPETER.IM>
INTERNET AREA	JARI ARKKO (FINLAND) <JARI.ARKKO@PIUHA.NET>	RALPH DROMS (CISCO) <RDROMS.IETF@GMAIL.COM>
OPERATIONS AND MANAGEMENT AREA	RONALD BONICA <RBONICA@JUNIPER.NET>	DAN ROMASCANU (AVAYA ISRAEL) <DROMASCA@AVAYA.COM>
REAL-TIME APPLICATIONS AND INFRASTRUCTURE AREA	GONZALO CAMARILLO <GONZALO.CAMARILLO@ERICSSON.COM>	ROBERT SPARKS (TEKELEC USA) <RJSPARKS@NOSTRUM.COM>
ROUTING AREA	STEWART BRYANT (CISCO) <STBRYANT@CISCO.COM>	ADRIAN FARREL (UK) <ADRIAN.FARREL@HUAWEI.COM>
SECURITY AREA	TIM POLK <TIM.POLK@NIST.GOV>	SEAN TURNER <TURNERS@IECA.COM>
TRANSPORT AREA	LARS EGGERT <LARS.EGGERT@NOKIA.COM>	DAVID HARRINGTON (HUAWEI USA) <IETFDBH@COMCAST.NET>

Table 4. IETF Area Directors.

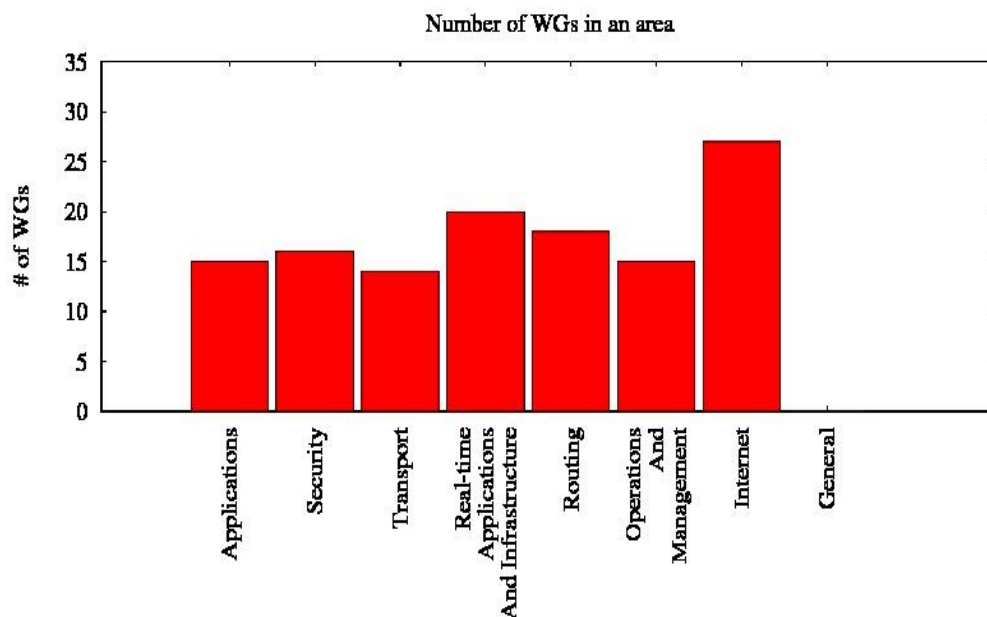


Figure 44: Number of WGs in different areas

ANNEX 5. The Call for Papers for FIA Book 2012

FIA book 2012

Future Internet – Future Internet – From Technological Promises to Reality

The Future Internet Assembly (FIA) is a success. FIA is a unique bi-annual event that brings together the participants of over 100 projects from a number of units in the EU Framework Programme 7 to share scientific and technical results and to discuss cross-domain research topics around the notion of creating new Future Internet technologies, applications and services, with a global world-wide view.

FIA began in the Spring of 2008 in Bled, Slovenia, and Spring 2012 will see the ninth FIA in Copenhagen. As with prior Spring FIAs, we are producing a book that aggregates both the results achieved in the Future Internet domain, and the possibilities of what we can expect in a near-medium term.

The previous FIA books are:

- [Towards the Future Internet: A European Research Perspective \(2009\)](#)
-
- [Towards the Future Internet: Emerging Trends from European Research \(2010\)](#)
-
- [Future Internet Assembly 2011: Achievements and Technological Promises](#)

Early on in the FIA time line we realised that a number of key elements were required to ensure success:

- Cross-domain discussions: on both core technical issues (such as FI architectures, FI services, FI experimentation, mobile FI or Internet of Things) and on horizontal issues such as socio-economics, privacy, trust and identity.
- Engagement with the application areas of the Future Internet and the users: to move from the FI technologies to sectors where innovation can be improved by the Future Internet technologies
- Provide results which are applicable in the day to day life.

In structuring the book, we suggest to cover the following topics with an orientation to the results provided.

- Future Internet Foundations: covers the core cross-domain technical and horizontal topics. The chapters under this section are: Architectural Issues; mobile Internet, Cloud Computing, Socio-Economic Issues; Trust and Identity; Search and Discovery; and Experiments and experimental design.
- Future Internet Areas: the technical domains associated with the Future Internet, mainly but not limited to Networks; Services; Internet of Things; Content; and Inter-area Issues.
- Future Internet Application Areas: user areas and communities, where Future Internet can boost their innovation capabilities. The chapters under this section are: Smart Cities;

Smart Energy; Smart Health; Smart Environment; Smart Transportation, Logistics and Mobility; Smart Manufacturing; Smart Agriculture, and Tourism.

- Future Internet infrastructures: covering experimentation and results in real infrastructures in the FI domain.

Submission

Submission and acceptance of chapters will be done through rigorous peer review to ensure originality, timeliness, relevance, and readability. We encourage the authors to send full chapter proposals for revision. Authors of accepted proposals will then be invited to submit camera ready chapters which will be subject to further acceptance, review, and revision.

Dates

- 2012-01-10 – Full paper submission
- 2012-02-17 - Notification for the accepted chapters
- 2012-03-12 - Camera ready chapters
- 2012-04-07 - Book published (tentative)

Editors - TBC

Federico Alvarez, John Domingue, Susana Avesanna, Frances Cleary, Petros Daras, Alex Galis, Anastasius Gavras, Srdjan Krco, Dave Lambert, Volkmar Lotz, Hennig Muller, Michael Nilsson, Burkhard Stiller, Anne-Marie Sassen, Georgios Tselentis, Theodore Zahariadis

ANNEX 6. FIA Standardisation Support Group

FP7 Projects coordinate their actions to support Future Internet Assembly standardisation activities

On 27th September 2010, 7 projects funded under the FP7 will defined a shared action plan to support Standardisation activities within the Future Internet Assembly (FIA). Already covering the domains of *testing, mobility, security, cloud computing, internet of things, internet of services* and *media*, this initiative will welcome participation of new projects and organisations to build a ‘standardisation community’ within the FIA.



CASAGRAS2 addresses the need for authoritative, on-going international cooperation in respect of the Internet of Things in a global context with worldwide partners. The network of expertise provides a vital understanding to the concepts and developments in different parts of the world.



MOSQUITO deals with the fragmentation of standards in the mobile Internet. It helps and supports activities related to the improvement of consistency inside standards based platforms and to the harmonization across all platforms.



MyFIRE increases the efficiency in the use of Future Internet experimental facilities. It identifies best practices for standardised approaches in testing and develops roadmaps including socio-economic considerations for an increase in research exploitation. It builds privileged links with Brazil, Russia, India and China.



NextMEDIA coordinates initiatives organized by the EC, including "Future Media & 3D Internet Task Force" and the "Future Content Networks" group. It structures the Future Media Internet research evolution path looking especially at standardisation efforts and international activities.



Effectsplus ensures the coordination of Trust and Security, Privacy, and Compliance for Future Internet through the structures and activities of the Future Internet Assembly (FIA).



SIENA contributes to the definition of future infrastructures roadmap focusing on interoperability and standards, Distributed Computing Infrastructures (DCI) projects and Standard Development Organisations (SDOs) to gain an in-depth understanding of how distributed computing technology is being developed in this context.



SOFI supports the organisation of the Future Internet Assembly (FIA), and in particular pursues the activities of and further develop the Future Internet Service Offer. It leads the work of producing an annual book with results from the FIA. It support dissemination of the Internet of Services community results and implements the Future Internet portal

Your contact:

Franck Le Gall
f.le-gall@inno-group.com
+33 492 388 418

Figure 45: Leaflet for FIA Standardisation Support Group

ANNEX 7. Poster of the FIA Standardisation Support Group



Figure 46: FIA Poster introducing FIA Standardisation Support Group

ANNEX 8. Identification of standardisation organisations relevant to future media internet

	ETSI, European Telecommunications Standards Institute http://www.etsi.org
Description: ETSI produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies. We are officially recognized by the European Union as a European Standards Organization. The high quality of our work and our open approach to standardization has helped us evolve into a European roots - global branches operation with a solid reputation for technical excellence. ETSI is a not-for-profit organization with more than 700 ETSI member organizations drawn from 62 countries across 5 continents world-wide. High quality and low time-to-market are our constant aims and we continually strive to collaborate with research bodies. We are active in vital complementary areas such as interoperability and we offer event services related to standardisation including forum hosting. Our international reputation is built on openness, discussion, consensus and direct input from our members	
Existing pre-standardisation support scheme <u>ISGs</u> (Industry Specification Groups) offer a very quick and easy alternative to the creation of industry fora, and are focused on a very specific activity. Yet they do have their own membership, which may consist of both ETSI Members and Non-members (under certain conditions), they have their own voting rules, they decide their own work programme, and approve their own deliverables. Existing ISGs • Open Radio equipment Interface (ORI) • Autonomic network engineering for the self-managing Future Internet (AFI) • Mobile Thin Client Computing (MTC) • Identity management for Network Services (INS) • Measurement Ontology for IP traffic (MOI) • Quantum Key Distribution (QKD)	Main working groups/areas <u>Related to FI/IoT:</u> TC M2M, TISPAN, ERM, ITS, MCD, MTS, CLOUD, EHEALTH, SCP, ISG AFI and 3GPP. http://portal.etsi.org Aeronautical, Broadband Wireless Access, Broadcast, DECT, Digital Mobile Radio, EMC, Emergency, Fixed-line Access, Environmental Aspects, Grid and cloud computing, Human Factors, Intelligent Transport, M2M, Maritime, Media Content Distribution, Medical, Mobile, Next Generation Networks, OSA, OSS, Powerline, Protocol Specification, Quality of Service, Quantum Key Distribution, Radio, Regulation & Legislation, Safety, Satellite, Security, Smart Cards, Testing, TETRA

	Open Grid Forum
Description The Open Grid Forum (OGF) is a community of users, developers, and vendors leading the global standardization effort for grid computing. The work of OGF is carried out through community-initiated working groups, which develop standards and specifications in cooperation with other leading standards organizations, software vendors, and users. More information on http://www.ogf.org	
Existing pre-standardisation support scheme Standards are developed within <i>Working Groups</i>. There are normally two or three co-chairs of any given working group; working groups are categorized into Areas. Areas allow OGF to group together activities that are related to each other. Currently the OGF has the following areas: Applications, Architecture, Compute, Data, Infrastructure, Management and Security. In the OGF document process the standards council plays the role of final reviewer of all documents, making sure that the documents produced by working groups fulfill the requirements of the organization to become part of the OGF document series. After one year of being a Proposed Recommendation, a working group can publish a document describing the various implementations of a specification and, more importantly, their interoperability or conformance with the specification. Once this has happened, a Proposed Recommendation is promoted to a full Recommendation document.	Main working groups/areas eResearch Function Grid Interoperation Now Community Group, Remote Instrumentation Services in Grid Environment, Grid Information Retrieval, Preservation Environments Enterprise Function Enterprise Grids Requirements, Storage Networking Community Group, Telecomm Community Group Standards Function The Standards function of OGF is responsible for development of architectures, specifications, roadmaps and glossaries for distributed computing software through OGF working groups and through the application of the OGF document process. The Standards function includes the management of technical liaisons with other Standards Development Organizations (SDOs) and to promote the adoption of standardized and interoperable distributed computing software.

	SNIA
---	--------------------

Description Incorporated in December 1997, the SNIA is a registered non-profit trade association. The members are dedicated to developing and promoting standards, technologies, and educational services to empower organizations in the management of information. The SNIA works toward this goal by forming and sponsoring Technical Work Groups (TWGs), producing (with our strategic partner Computerworld) the Storage Networking World Conference series, building and maintaining a vendor neutral Technology Center in Colorado Springs, and promoting activities that expand the breadth and quality of the storage and information management market	
Existing pre-standardisation support scheme SNIA standards are primarily related to data, storage, and information management and address such challenges as interoperability, usability, and complexity. They start out in SNIA-sponsored Technical Working Groups (member collaboration efforts centering on best practices) or as contributions from independent vendor collaborations, and are subject to a rigorous processes involving checks and technology reviews by SNIA’s Members, Technical Council, and Board of Directors, conducted under provisions that respect and protect intellectual property and address licensing of essential claims. A SNIA standard that has completed these processes is labeled a SNIA Technical Position, which signifies that the SNIA endorses and recommends the ideas, methodologies, and technologies described. The SNIA may take SNIA Technical Positions to ANSI, ISO, and other national and international standards bodies for additional endorsement.	Main working groups/areas SNIA Forums and Initiatives primarily focus on technology promotion and technical marketing activities. Forums do not develop technologies or specifications, though Initiatives can. SNIA's Forums and Initiatives include the Cloud Storage Initiative, the Data Protection and Capacity Optimization Committee, the Ethernet Storage Forum, the Green Storage Initiative, Storage Management Initiative, Solid State Storage Initiative, the Storage Security Industry Forum and the XAM Initiative and

 WholeSale Application Community	
Description WAC’s objective is to commercialize products for its member companies. Open Web standards are utilized in support of this commercialization effort as long as such adoption does not impact required time to market. The WAC widget specification is therefore based on W3C and OMTP standards to the greatest extent possible, given that these standards were developed in parallel to the WAC’s specifications.	
Existing pre-standardisation support scheme Add here a description of pre-standardisation	Main working groups/areas List here the relevant working groups or working areas

	World Wide Web Consortium
Description The W3C mission is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web. Below we discuss important aspects of this mission, all of which further W3C's vision of One Web.	
Existing pre-standardisation support scheme Add here a description of pre-standardisation	Main working groups/areas List here the relevant working groups or working areas

	The 3rd Generation Partnership Project (3GPP)
Description The original scope of 3GPP was to produce Technical Specifications and Technical Reports for a 3G Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes).	
Existing pre-standardisation support scheme Add here a description of pre-standardisation	Main working groups/areas List here the relevant working groups or working areas

	Open Mobile Alliance
Description The mission of the Open Mobile Alliance is to facilitate global user adoption of mobile data services by specifying market driven mobile service enablers that ensure service interoperability across devices, geographies, service providers, operators, and networks while allowing businesses to compete through innovation and differentiation.	
Existing pre-standardisation support scheme Add here a description of pre-standardisation	Main working groups/areas List here the relevant working groups or working areas

 LiMo Foundation	Linux Foundation
---	---

Description

LiMo Foundation is an industry consortium dedicated to creating the first truly open, hardware-independent, Linux-based operating system for mobile devices. Backing from major industry leaders puts LiMo at the Heart of the Mobile Industry and makes LiMo the unifying force in Mobile Linux.

The mission of the LiMo Foundation is to create an open, Linux-based software platform for use by the whole global industry to produce mobile devices through a balanced and transparent contribution process enabling a rich ecosystem of differentiated products, applications, and services from device manufacturers, operators, ISVs and integrators.

Existing pre-standardisation support scheme

Android

Main working groups/areas

List here the relevant working groups or working areas

SYMBIAN

Symbian foundation

Description

The Symbian Foundation provides, manages and unifies the platform for download and development. With the Symbian platform source code published under the Eclipse Public License the entire platform is available to all for free, bringing additional innovation and more frequent and widely-sourced code and feature contributions; and engaging an even broader community in future development.

Existing pre-standardisation support scheme

Add here a description of pre-standardisation

Main working groups/areas

List here the relevant working groups or working areas



IETF, The Internet Engineering Task Force

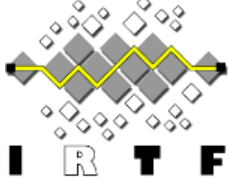
<http://www.ietf.org>

Description:

The Internet Engineering Task Force (IETF) is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.). Much of the work is handled via mailing lists. The IETF holds meetings three times per year.

The IETF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Internet Engineering Steering Group (IESG). Providing architectural oversight is the Internet Architecture Board, (IAB). The IAB also adjudicates appeals when someone complains that the IESG has failed. The IAB and IESG are chartered by the Internet Society (ISOC) for these purposes. The General Area Director also serves as the chair of the IESG and of the IETF, and is an ex-officio member of the IAB.

Existing pre-standardisation support scheme IETF Working Groups (WGs) are the primary mechanism for development of IETF specifications and guidelines, many of which are intended to be standards or recommendations. Working Groups are typically created to address a specific problem or to produce one or more specific deliverables (a guideline, standards specification, etc.). Working Groups are generally expected to be short-lived in nature. Upon completion of its goals and achievement of its objectives, the Working Group is terminated. Each Working Group has a charter. WG charters state the scope of work for group, and lay out goals and milestones that show how this work will be completed. More information about formation of IETF working groups can be found at http://www.ietf.org/wg/	Main working groups/areas • 6lowpan - IPv6 over Low power WPAN • 6man - IPv6 Maintenance • Ancp - Access Node Control Protocol • Autoconf - Ad-Hoc Network Autoconfiguration • Csi - Cga & Send maIntenance • Dhc - Dynamic Host Configuration • Dnsex - DNS Extensions • Hip - Host Identity Protocol • Intarea - Internet Area Working Group • Ipdvb - IP over DVB • I2tptext - Layer Two Tunneling Protocol Extensions • lisp - Locator/ID Separation Protocol • mext - Mobility EXTensions for IPv6 • mif - Multiple Interfaces • mip4 - Mobility for IPv4 • mipshop - Mobility for IP: Performance, Signaling and Handoff Optimization • multimob - Multicast Mobility • netext - Network-Based Mobility Extensions • netlmm - Network-based Localized Mobility Management • ntp - Network Time Protocol • pppext - Point-to-Point Protocol Extensions • savi - Source Address Validation Improvements • shim6 - Site Multihoming by IPv6 Intermediation • softwire - Softwires • tictoc - Timing over IP Connection and Transfer of Clock • trill - Transparent Interconnection of Lots of Links
--	---

	IRTF, The Internet Research Task Force http://www.irtf.org/
Description: The Internet Research Task Force (IRTF) is a sister group to the Internet Engineering Task Force (IETF). Its stated mission is “To promote research of importance to the evolution of the future Internet by creating focused, long-term and small Research Groups working on topics related to Internet protocols, applications, architecture and technology”.	
Existing pre-standardisation support scheme The IRTF Research Groups work on topics related to Internet protocols, applications, architecture and technology. Research Groups are expected to have the stable long term (with respect to the lifetime of the Research Group) membership needed to promote the development of research collaboration and teamwork in exploring research issues. Participation is by individual contributors, rather than by representatives of organizations. The IRTF is managed by the IRTF Chair in consultation with the Internet Research Steering Group (IRSG). A Research Group may be established at the initiative of an individual or group of individuals. Anyone interested in creating an IRTF Research Group must submit a charter for the proposed group to the IRTF Chair along with a list of proposed founding members. The charter will be reviewed by the IRSG and then forwarded to the IAB for approval. More information about formation of IRTF working groups can be found at http://www.irtf.org/	Main working groups/areas • Anti-Spam Research Group (ASRG) • Crypto Forum Research Group • Delay-Tolerant Networking Research Group (DTNRG) • Host Identity Protocol (HIP) Research Group • Internet Congestion Control Research Group • IP Mobility Optimizations (Mob Opts) Research Group • Network Management Research Group Charter (NMRG) • Peer-to-Peer Research Group • Public Key Next-Generation Research Group • Routing Research Group • Scalable Adaptive Multicast Research Group • Transport Modeling Research Group • Virtual Networks Research Group (VNRG)

	MPEG, Moving Picture Experts Group http://mpeg.chiariglione.org/
Description: The Moving Picture Experts Group (MPEG) is a working group of ISO/IEC in charge of the development of international standards for compression, decompression, processing, and coded representation of moving pictures, audio and their combination. MPEG usually holds four meetings a year. These comprise plenary meetings and subgroup meetings on Requirements, Systems, Video, Audio and 3D Graphics. Participation is open to experts duly accredited by an appropriate National Standards Body. On average a meeting is attended by more than 300 experts from some 20 countries representing more than 200 companies spanning all industry domains with a stake in digital audio, video and multimedia.	

Existing pre-standardisation support scheme Unlike other standards committees where the development work is done outside and the role of the committee is by and large the management of the formal process of standards approval, the development of MPEG standards takes place in MPEG. At each meeting different technical submissions are reviewed by the committee and work is assigned to members for the next meeting. This allows MPEG to attract the best expertise in its fields and to produce the technically most advanced standards. MPEG membership is based on made on individuals technical experts, typically belonging to companies and organisations. When the scope of new work has been sufficiently clarified, MPEG usually makes open requests for proposals, called Calls for Proposals CfP). More information about MPEG CfPs can be found at http://mpeg.chiariglione.org/hot_news.htm Contacts for each country can be found at http://www.iso.ch/adresse/address.html. It's important to seek membership of the right committee (formally ISO/IEC JTC 1/SC 29/ WG 11 (MPEG), because national standards bodies have competence in manifold areas of standardisation.	Main working groups/areas (in development) • MPEG-4 in its different components (Systems, Video, Audio, File Format, 3D Graphics, Composition, Fonts etc.) • MPEG-7, particularly in Profiles and MPEG Query Format • MPEG-21, particularly in the area of Contract Expression Language • MPEG-B, particularly in the area of Dynamic Adaptive Streaming over HTTP (DASH) • MPEG-C, particularly Reconfigurable Video Coding • MPEG-D, particularly Universal Speech and Audio Coding • MPEG-U, particularly in the area of advanced user interfaces • MPEG-V, particularly in the area of extensions • 3D Video Coding, the standard for coding 3D Visual information • High Efficiency Video Coding, the standard for a new frontier in video coding. • MPEG-M 2nd edition, the standard for digital media ecosystems
---	--

Open Grid Forum

Description

The Open Grid Forum (OGF) is a community of users, developers, and vendors leading the global standardization effort for grid computing. The work of OGF is carried out through community-initiated working groups, which develop standards and specifications in cooperation with other leading standards organizations, software vendors, and users.

More information on <http://www.ogf.org>

Existing pre-standardisation support scheme	Main working groups/areas
Standards are developed within <i>Working Groups</i>. There are normally two or three co-chairs of any given working group; working groups are categorized into Areas. Areas allow OGF to group together activities that are related to each other. Currently the OGF has the following areas: Applications, Architecture, Compute, Data, Infrastructure, Management and Security. In the OGF document process the standards council plays the role of final reviewer of all documents, making sure that the documents produced by working groups fulfill the requirements of the organization to become part of the OGF document series. After one year of being a Proposed Recommendation, a working group can publish a document describing the various implementations of a specification and, more importantly, their interoperability or conformance with the specification. Once this has happened, a Proposed Recommendation is promoted to a full Recommendation document.	<i>eResearch Function</i> Grid Interoperation Now Community Group, Remote Instrumentation Services in Grid Environment, Grid Information Retrieval, Preservation Environments <i>Enterprise Function</i> Enterprise Grids Requirements, Storage Networking Community Group, Telecomm Community Group <i>Standards Function</i> The Standards function of OGF is responsible for development of architectures, specifications, roadmaps and glossaries for distributed computing software through OGF working groups and through the application of the OGF document process. The Standards function includes the management of technical liaisons with other Standards Development Organizations (SDOs) and to promote the adoption of standardized and interoperable distributed computing software.

SNIA

Description	
Incorporated in December 1997, the SNIA is a registered non-profit trade association. The members are dedicated to developing and promoting standards, technologies, and educational services to empower organizations in the management of information. The SNIA works toward this goal by forming and sponsoring Technical Work Groups (TWGs), producing (with our strategic partner Computerworld) the Storage Networking World Conference series, building and maintaining a vendor neutral Technology Center in Colorado Springs, and promoting activities that expand the breadth and quality of the storage and information management market	
Existing pre-standardisation support scheme	Main working groups/areas
SNIA standards are primarily related to data, storage, and information management and address	SNIA Forums and Initiatives primarily focus on technology promotion and

such challenges as interoperability, usability, and complexity. They start out in SNIA-sponsored Technical Working Groups (member collaboration efforts centering on best practices) or as contributions from independent vendor collaborations, and are subject to a rigorous processes involving checks and technology reviews by SNIA’s Members, Technical Council, and Board of Directors, conducted under provisions that respect and protect intellectual property and address licensing of essential claims.

A SNIA standard that has completed these processes is labeled a SNIA Technical Position, which signifies that the SNIA endorses and recommends the ideas, methodologies, and technologies described.

The SNIA may take SNIA Technical Positions to ANSI, ISO, and other national and international standards bodies for additional endorsement.

technical marketing activities. Forums do not develop technologies or specifications, though Initiatives can. SNIA's Forums and Initiatives include the Cloud Storage Initiative, the Data Protection and Capacity Optimization Committee, the Ethernet Storage Forum, the Green Storage Initiative, Storage Management Initiative, Solid State Storage Initiative, the Storage Security Industry Forum and the XAM Initiative and

WholeSale Application Community

Description

WAC’s objective is to commercialize products for its member companies. Open Web standards are utilized in support of this commercialization effort as long as such adoption does not impact required time to market. The WAC widget specification is therefore based on [W3C](#) and [OMTP](#) standards to the greatest extent possible, given that these standards were developed in parallel to the WAC’s specifications.

Existing pre-standardisation support scheme

Add here a description of pre-standardisation

Main working groups/areas

List here the relevant working groups or working areas

The 3rd Generation Partnership Project (3GPP)

Description

The original scope of 3GPP was to produce Technical Specifications and Technical Reports for a 3G Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes).

Existing pre-standardisation support scheme	Main working groups/areas
Add here a description of pre-standardisation	List here the relevant working groups or working areas

Open Mobile Alliance

Description	
The mission of the Open Mobile Alliance is to facilitate global user adoption of mobile data services by specifying market driven mobile service enablers that ensure service interoperability across devices, geographies, service providers, operators, and networks while allowing businesses to compete through innovation and differentiation.	
Existing pre-standardisation support scheme	Main working groups/areas
Add here a description of pre-standardisation	List here the relevant working groups or working areas

Linux Foundation

Description	
LiMo Foundation is an industry consortium dedicated to creating the first truly open, hardware-independent, Linux-based operating system for mobile devices. Backing from major industry leaders puts LiMo at the Heart of the Mobile Industry and makes LiMo the unifying force in Mobile Linux.	
The mission of the LiMo Foundation is to create an open, Linux-based software platform for use by the whole global industry to produce mobile devices through a balanced and transparent contribution process enabling a rich ecosystem of differentiated products, applications, and services from device manufacturers, operators, ISVs and integrators.	
Existing pre-standardisation support scheme	Main working groups/areas
Android	List here the relevant working groups or working areas

ANNEX 9. Identification of the (pre-)Standardization projects intentions or/and commitments or/and achievements

Internet of things

Topic	Item	Involved Standard body	Related FI projects
M2M/IoT Architecture	M2M Definitions	ETSI TC M2M	CASAGRAS2, IoT-A
	M2M Security	ETSI TC M2M	CASAGRAS2, IoT-A
	• M2M Functional Architecture • M2M service requirements • Reuse of Core Network Functionality by M2M Service Capabilities	ETSI TC M2M	CASAGRAS2, IoT-A
	• Low-cost M2M in LTE	3GPP RAN	EXALTED
M2M/IoT Use cases	M2M/IoT Use Cases: • eHealth , • Connected Consumer • City Automation • Automotive Applications	ETSI TC M2M	CASAGRAS2, IoT-A
	Impact of Smart Grids on M2M platform	ETSI TC M2M	CASAGRAS2, IoT-A
Autonomic network	• Scenarios, Use Cases, and Requirements for Autonomic/Self-Managing Future Internet. • Generic Autonomic Network Architecture	ETSI ISG AFI	EFIPSANS, UniverSelf, IoT-A

RFID	• Electromagnetic Compatibility (EMC) and Radio Spectrum Matters • Intelligent Transport Systems • eHealth	ETSI TC ERM TG34 ETSI TC ITS ETSI EP EHEALTH	GRIFS, CASAGRAS, CASAGRAS2, RFIDinEurope (RACEnetworkRFID), EC DG ENTR Mandate M/436
Use Cases and Requirements	• Use Cases and Requirements	IETF	IoT-A

Management of Networks and Distributed Systems

Topic	Item	Involved Standard body	Related FI projects
Autonomic network	• <u>Scenarios, Use Cases, and Requirements for Autonomic/Self-Managing Future Internet.</u> • <u>Generic Autonomic Network Architecture</u> • Autonomicity-enabled Reference Architectures, Requirements Analysis and Specification of Implementation-oriented Solutions 1. “Autonomicity-enabled NGN architecture” (Fixed) 2. "Autonomicity-enabled ADS/FTTH" 3. "Autonomicity-enabled LTE/EPC" (NGMN i.e. Mobile) 4. “Autonomicity-	ETSI ISG AFI	EFIPSANS, IoT-A UniverSelf set of actions: a) update requirements defined in AFI to include UniverSelf UCs work and requirements, b)update AFI reference model including UniverSelf modules/interfaces based on UMF work, c)contribute in the mapping of UMF architecture to various networking environments.

	enabled Ad-Hoc Wireless Network architecture” (source: ETSI/AFI work plan)		
IP Network Management	Autonomics in the Internet (knowledge plane, learning, data location, ...) - See NMRG charter for more details.	IRTF/NMRG	UniverSelf
Content Delivery Network Interconnection	The exchange of content information (meta-data) between CDNs, The exchange of content amongst CDNs, The request routing amongst CDNs.	IRTF/CDNI	NextMEDIA
Learning Capable Communication Networks	Learning for Traffic Engineering Learning for Routing Learning for Fault-diagnosis	IRTF/LCCN RG BoF	UniverSelf
Network Complexity	1) Defining "network complexity", and defining relevant metrics. 2) Comparative research between various network architectures, protocols or approaches. 3) Methods and ideas to contain, control, or reduce complexity in IP based networks. 4) Collect use cases regarding specific network designs or failure cases where complexity played a role.	IRTF/COMPLEXITY RG BoF	UniverSelf

	(source: Complexity BoF announcement at IETF81)		
Management of next generation mobile networks	Standardization requirements (SON in RAN)	NGMN Alliance	UniverSelf
Delay Tolerant networks		PRoPHET	N4C (FIRE)

Mobile Internet

Topic	Item	Involved Standard body	Related FI projects
NFC Mobile Applications, M2M Mobile	Smart Card Platform, LTE	ETSI TC SCP and ETSI 3GPP	CASAGRAS2 (IoT), IoT-A (IoT)
	• Specification for a UICC dedicated to Machine to Machine (M2M) applications, available in TS 102 671	ETSI TC SCP	CASAGRAS2 (IoT)

Media and content

Topic	Item	Involved Standard body	Related FI projects
Internet of Content	• 3D Gaming 3D gaming graphics delivery	ETSI TC MCD	CASAGRAS2 (IoT), IoT-A (IoT)
	• TV-Applications	ETSI TC MCD	CASAGRAS2 (IoT), IoT-A (IoT)
Gaming	• IPTV Content Delivery Networks, P2P, Security, QoS, Fixed Mobile Convergence, NGN, Energy Efficiency Home Network,	TC TISPAN	CASAGRAS2 (IoT), IoT-A (IoT) SAIL

Testing

Topic	Item	Involved Standard body	Related FI projects
Testing language	• TTCN3	ETSI MTS	Go4IT (FIRE) TT-Medal

	• UML Testing profile	OMG	<i>Under investigation</i>
	• TCL	Open source	<i>Under investigation</i>
	• XML-based	W3C –open , OASIS	HITCH, ebusiness , egov, ..projects
Modelling language	• MSC	ITU-T	<i>Under investigation</i>
	• SDL	ITU-T	<i>Under investigation</i>
	• Test results description language (WiseML)		WISEBED (FIRE)
Testbeds management	Resource descriptor	Teagle DEN-ng	PII / (FIRE) NOVI (FIRE)
	Testbeds benchmarking	Under investigation. See MyFIRE deliverable 2.2	CREW (FIRE) PII (FIRE)
	Connector model (Open API)		TEFIS (FIRE)
	Authorization and Access control	Under investigation	PII (FIRE)

Multi-layer & Multi-domain networks

Topic	Item	Involved Standard body	Related FI projects
Multi-layer multi-domain Control Plane	Hierarchical PCE	IETF	STRONGEST

Trust, security and privacy

Topic	Item	Involved Standard body	Related FI projects
RFID/IoT Security and Privacy	• RFID EC Mandate M/436 Phase 1 • ETSI TR 187 020	ETSI, CEN, CENELEC At ETSI it is TC TISPAN WG7, ETSI TC ERM TG34 and ETSI TC M2M	EC DG ENTR CEN/CENELEC/ETSI funded Standardisation Mandate M/436
	• Development of an EN for the enhanced privacy & security protection of the NGN • EN 387 018	ETSI TC TISPAN WG7	Voluntary work of ETSI Members in ETSI TC TSPAN WG7
Trust	• Certification of distributed and autonomic systems and processes	ETSI AFI(+ CTI, MTS)	UniverSelf

Grids and cloud computing

Topic	Item	Involved Standard body	Related FI projects
GRID/CLOUD for Telco	• Standardization Requirements for Cloud Services, ETSI TR 102 997	ETSI TC CLOUD	SIENA, , , CASAGRAS2, IoT-A, SAIL
	• Specialist Task Force on ICT GRID Technologies Interoperability and Standardization ETSI TR 102 659-1 -2 and ETSI TR 102 766	ETSI TC CLOUD (former TC GRID)	DG ENTR funded ETSI STF 331
	• Grid Component Model, ex. ETSI TS 102 {811, 828, 830}	ETSI TC CLOUD (former TC GRID)	CoreGRID, GRIDComp, Akogrimo

Software, services and virtualisation

Topic	Item	Involved Standard body	Related FI projects
Service choreography	• BPMN 2 Revision	OMG	CHOReOS
	• UML Profile for BPMN Processes	OMG	CHOReOS

Cloud management	• OCCI and further standards for cloud access, storage, interoperability etc. • NSI-WG - Network Service Interface Working Group • NML-WG - Network Markup Language Working Group • ISOD-RG - Infrastructure Services On-Demand Provisioning Research Group	OGF	SLA@SOI (until 5/2011) CONTRAIL Mosaic VISION CLOUD GEYSERS
	• Monitoring of Platform-as-a-Service (PaaS)	Possibly ETSI	SRT-15 SAIL BONFIRE (FIRE)
	• Control and management of cloud connectivity and networking	ETSI TISPAN – OIF IETF (for PCE/GMPLS/ASON related issues) DMTF - Distributed Management Task Force, Cloud Management Working Group	SAIL, GEYSERS
Testing language	• UML2 Testing Profile: inclusion of SOA and Clouds	OMG	FITTEST
Virtual Networks	• IETF77 and IETF78 meetings the project representatives made contribution to the RG discussion.	IETF - VNRG Virtual Networks Research Group	GEYSERS
	• facilitates virtualization and control of the network environment through secure and standardized interfaces	OpenFlow	OFELIA (FIRE)
Service modelling	• SoaML	OMG	FITTEST
	• PIM4Cloud (SoaML extension)	OMG	FITTEST REMICS
	• Mashup Description Language	Open Mashup Alliance	OMELETTE
	• Widgets	W3C	OMELETTE

Cognitive Radio Systems

Topic	Item	Involved Standard body	Related FI projects
Architecture	• Functional architecture (FA) for Reconfigurable Radio Systems	ETSI RRS TC	E3
	• Architectural Building Blocks Enabling Network-Device Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Access Networks	IEEE SCC41 P1900.4	E3
Control Channels for the Cooperation of Cognitive Management Systems	• Information flow, implementation options regarding control channels; information exchange between infrastructure and devices, and between devices	ETSI RRS TC	OneFIT
White Spaces	• Operation in White Space Frequency Bands	ETSI RRS TC	QoSMOS
	• Operation in White Space Frequency Bands	IEEE SCC41 P1900.4	QoSMOS
	• Protocol for database interface	IETF PAWS	QoSMOS
Cognitive Pilot Channel (CPC)	• Cognitive Pilot Channel (CPC) information flow and content	ETSI RRS TC	E3
Spectrum sensing	• Spectrum Sensing Interfaces and Data-Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems	IEEE SCC41 P1900.6	E3 ORACLE
Transceiver Facility	• Transceiver Facility Specification	SDR Forum	E3
WiMAX	• WiMAX Multi-hop Relay station	IEEE 802.16j , WiMAX forum	REWIND
UWB technologies	• Short Range Devices using UWB technologies, UWB location tracking and sensing devices	ETSI ERM TG31a, ETSI TG31c	EUWB

Green Technologies

Topic	Item	Involved Standard	Related FI
-------	------	-------------------	------------

		body	projects
Energy Efficiency Evaluation Framework (E3F)	• Energy efficiency related metrics • Power models • Large scale deployment models and long term traffic models for aggregation to global scale	3GPP RAN/ Release 11	EARTH (NOF)
	• Metrics	ETSI TC EE TC EE/ EEPS ITU-T SG.5/ Q20/5, Q18/5	EARTH (NOF)
	• Normalization process	GSMA MEE/Benchmarking service	EARTH (NOF)
Energy efficient networks	• Energy metrics	ETSI Environmental Engineering Committee	STRONGEST
Energy Management	• - Requirements for energy management. • - Energy management framework. • - Energy-aware Networks and Devices MIB document • - Power and Energy Monitoring MIB document • - Battery MIB document • - Applicability statement	IETF EMAN	GEYSERS, ECONET
Active Antennas	• Standalone configuration and Cooperative Multi Point Transmission, CoMP.	ETSI Open Radio equipment Interface (ORI)	EARTH (NOF)
Dynamic Multimedia Broadcast multicast service Single Frequency Network (MBSFN)	• Packet scheduling operation • Relay Nodes scheduling	3GPP RAN/ Release 11	EARTH (NOF)

Dynamic Bandwidth Adaptation	• Carrier Aggregation	3GPP RAN/ Release 11	EARTH (NOF)
Static and dynamic modelling of ON-OFF schemes and Cell-size Optimization	• Static and dynamic modelling of ON-OFF schemes and Cell-size Optimization	3GPP NGMN Alliance GSM Association	EARTH (NOF)

Acronyms used for project clusters identification

NoF	The network of the future
SSAI	Service and sw architectures, infrastructures & engineering
IoT	Internet of Things and Future Internet Enterprise Systems
Trust	Secure, dependable and trusted infrastructures
NeM	Networked media
FIRE	New Paradigms and Experimental Facilities
CIP	Critical Infrastructure Protection

