



**European Commission**  
**IPv6 Task Force**

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## Second IPv6 Task Force Phase II meeting

### 1. Opening of the Meeting

Latif Ladid, chairman of the EC IPv6 Task Force, opened the meeting.

Latif welcomed the audience, and thanked Patrik Fältström, Area Director of the IETF Applications area, for joining the meeting. He explained that the agenda for the day is focused on short presentations in order to provoke discussion.

### 2. Participants

The attendance list is shown in Annex A.

### 3. Agenda

The approved agenda is presented in Annex B.

### 4. Chairman's Report (Latif Ladid, IPv6 TF-SC)

Latif reported briefly on the visit of the European Commission IPv6 TF delegation to Japan, December 17-20, 2002. Eight delegates visited a number of Japanese vendors and ISPs, and met with the Japanese IPv6 Promotion Council. Joint research plans emerged that will include security (including PKI), intelligent (vehicle) transport services (ITS) and fellowship programmes. The level of research appears similar in Japan to the EC, but IPv6 deployment is more advanced.

Latif has been working with the North American IPv6 Task Force (NAv6TF). A meeting was held between the NAv6TF and Richard Clarke of the US government on October 17<sup>th</sup> 2002 in Boston, to discuss IPv6 in the context of the US government and DoD. A follow-up meeting occurred with Howard Schmidt in November, after which a submission of a response to the Cybersecurity requirements was made in December, along with a recommendation to the White House of an IPv6 Roadmap for the US.

A Global IPv6 Showcase is being built, combining existing showcases such as the Japanese "Galleria" and the Eurov6 project. Also, an "IPv6 Ready" program is being launched by the IPv6 Forum to recognise IPv6 features in products, such that a single logo could appear in marketed IPv6 products.

### 5. Invited presentation, Patrik Fältström, IETF Applications Area Director

Patrik gave a presentation focused on the importance of end-to-end communications on the Internet, describing what IPv6 is solving for applications, and why NAT is bad.

One deployment hurdle is people not seeing why IPv6 is better; while this is not necessarily an issue for end users, it should be for designers and developers. Any IP device should be able to

communicate directly with any other IP device. Firewalls may be deployed, but should not be confused with NAT (in the sense that NAT is often considered to be a security mechanism). NAT use is in a strict client-server relationship, browser to server, while really in the Internet architecture we have peers communicating, on an equal footing.

NAT hinders some classes of applications. SIP and FTP have both a control and a data channel, and don't work through a NAT without a dedicated application layer gateway (ALG) or "kludge", such as STUN for IPv4. We certainly don't need or want to see IPv6 NATs deployed. We also don't want site local IPv6 addresses appearing on the global Internet, but they may be useful for non-connected sites.

Other points raised by Patrik included:

- Why are the EC (IST or other) web pages not available over IPv6?
- The revocation and winding down of the 6Bone IPv6 "experimental" network is being discussed in the IETF – when should this be done?
- When buying IPv6 connectivity, we want IPv6 carried (dual-stack) on the same link as the IPv4 supplier, for economic reasons. How do we encourage that?

## 6. IPv6 security (Latif Ladid, EC IPv6 TF chairman)

Latif described the problems of deploying secure systems in today's Internet, and how IPv6 could be used to secure direct end-to-end connectivity between hosts (in the absence of site NATs). Products are required, including IPv6 firewalls and secure routers. We need best practice in how to deploy these in companies and ISPs, and how to replace NATs with (more secure) IPv6 routers (which implies much stronger end system security). IPv6 in current deployment is not secure today, but we have the tools to make it so (and mechanisms in the IPv6 standards that "only" need implementation).

We need to be clear on IPv6-specific privacy issues (beyond RFC3041 Privacy Extensions) and how they impact (or clash with) existing or proposed EU legislation (this also applies to location-based services, which are not IPv6-specific).

Alberto has a PhD and paper in this area and would be an ideal person to send a summary to the TF. There is also a Privacy Forum that may have useful information. An existing EC document on privacy implications contains some misleading information and should be "rebutted" through a TF position statement.

The meeting agreed to produce a 3-page security and privacy paper – volunteers included Alberto, Jordi, Patrick and Wolfgang.

IPv6 DNS has a number of "problems", for example is a host with an IPv4 address different from a host with an IPv6 address? This is a referential integrity issue, how we handle AAAA (IPv6) vs A (IPv4) DNS-returned addresses. If we reference a host-by-host name we should get the same host regardless of service. A second issue is root DNS name servers; there is no IPv6 transport, and no AAAA records for the root name servers – a problem is fragmented packets or truncated answers – should there be different answers based on the transport, e.g. do we return an IPv6 root zone with only AAAA records when queried over IPv6? The problem here is that the query doesn't come from client that wants the info, but an intermediate server, e.g. where an IPv6-only client is using a dual-stack DNS resolver. Another problem for root DNS servers is finding robust software to use on them – BIND9 is not believed to be hardened enough for root server use –

those servers still use BIND8 (which does not by default have IPv6 transport). But DNS can work because all clients can use a forwarding server that can be dual stack.

The meeting agreed to produce a one-page IPv6 DNS document (position paper), volunteers were Tim, PatrikF and PeterH.

A question was raised over DNSsec, but this is not an IPv6-specific issue.

## **7. PKIv6 (Jordi Palet, Consulintel)**

A PKI service can support many functions – mobility, e2e security, distributed services, resource access control, etc, and is important in support of a security infrastructure. The University of Murcia has already done some IPv6 PKI work in the Euro6IX project and has a working service.

There are many issues beyond the technology. PKIs are already in use in the banking and cellular operator domains for example, but the TF should make recommendations for IPv6 PKI deployment, which should give good reasons for investment in the technology, and list any differences for IPv4 and IPv6 deployment (which may of course be minor). It was noted that the issue of “trust” is fuzzy – would users trust government certificates (e.g. to pay taxes); however most Internet users already use the embedded certificates in web browsers without realising their presence or significance (beyond the “padlock” icon being present).

PKI is useful for IPv6 (the address space helps), but it is not mandatory for IPv6 success. Thus it should not be promoted too heavily as being critical.

Key management is a real issue for IPsec; this is not an IPv6-specific issue.

There will be user-oriented issues with certificate deployment; how will they be used in home networking environments for example, where ease of use is important?

The IETF is looking at X.509 certificates, issues with them, and implementations of them. Applications often don't check if a certificate has changed on a hard drive, and most don't support a signed hierarchy so cross-certification doesn't work. In the IETF the topic of DNS security is discussed, where key records are only used for signing DNS records – an issue is how to have a store of host keys for SSL or IPsec use, how to inherit trust from a PKI or from DNSsec into these other host records.

There is a question over which encryption/security algorithms are to be used.

DNS has trust in delegations. If we have one PKI, what can we use it for? How much trust can we then place on it?

Jordi will coordinate a TF position paper on this topic.

## **8. ISP Deployment Issues (Peter Hovell, BT Exact Technologies)**

With the growth of always on, new types of IP devices, and DSL/cable modems, the future in theory looks good for IPv6. But there is effectively zero commercial deployment in Europe. It doesn't stack up. One reason is that ISPs are short of cash, and they need real, viable service revenues or savings to deploy. We need carrots not sticks. We should make sure now that

everything is in place technically so people can go to IPv6 quickly when it is more financially viable. We should educate the end users and application developer people now.

What bits are missing? First, IPv6 multihoming for an ISP; the IETF multi6 WG is moving very slowly on this. Deployment is complex for an ISP; there are no reliable IPv6 transit offers in France, for example. A classic “chicken and egg” problem.

The TF must identify real deployment cases. Also it must not raise expectations. Moving to IPv6 has short-term pain for long-term gain. In China there is no real IPv4 address space; thus IPv6 is easier to go to from the start (less legacy). It may be similar in Eastern Europe as the EU spreads east.

We need millions of users for IPv6 to take off – how can an ISP deploy an IPv6 service to millions? Some people in the IETF seem to want an 8+8 type solution for multihoming – splitting the identifier and locator (routing). Some people believe the architecture is wrong and we should start again, but that is a long-term issue; the real problem is in the here and now.

Rosa reported that the aero industry still uses some X.25; thus this is also a “green field” IPv6 deployment scenario (and a possible FP6 project area).

A briefing paper on IPv6 ISP deployment status and hurdles is required – a one-pager with the most important six items (action for Peter H).

## **9. IPv6 DNS and other issues (Tim Chown, University of Southampton)**

Many of the IPv6 “missing pieces” are summarised in the 6NET project deliverable D2.5.1 (see <http://www.6net.org/publications/>).

Perhaps the most important issue for day-to-day use of IPv6 is international IPv6 routing stability. Tim will write a short position paper on this issue.

Other issues (in short, see 6NET D2.5.1 for more detail) include:

- Having two protocols to secure during transition
- Choice of whether to use IPv6 ahead of IPv4 where both exist
- How to do secure autoconfiguration (see the IETF send WG)
- How to do DNS discovery for stateless autoconfiguring hosts
- Best practice for use of IPv6 site local scope addresses
- IPv6 transport for SNMP
- Development of dual IPv4/IPv6 MIBs
- Prefix delegation methods for ISPs (DHCPv6 option)
- IPv6 Multicast deployment
- IPv6 Flow label use – currently defined to have no semantics or meaning

The issue of whether IST (and other) projects should carry “living” deliverables that get updated was discussed. Some projects (e.g. 6NET) have some deliverables of this type. As it stands, many pieces of work (e.g. MIPv6 evaluations) become dated very quickly. There is no easy solution to this problem.

## 10. Case study: National IPv6 TF in France (Patrick Cocquet, 6WIND)

Details of the French IPv6 TF activities can be seen in the presentation slides available separately. The French TF has been very successful in engaging people from all sectors, most importantly from the government and industry. It has held two main meetings, one on 28<sup>th</sup> October 2002, one on 10<sup>th</sup> December 2002. The latter meeting included discussion with consultants producing a report for the French ministry of Research and the French ministry of Industry.

The French research network, Renater 3, is now dual-stack IPv4/IPv6 since December 2002.

The automobile industry is seen as a key sector for IPv6 in France, including multi-access GSM, GPRS, 3G and WiFi access for cars, and WiFi services in locations such as petrol stations and home networks (while the car is in the garage at home). The problems of IP addresses (with IPv4) for GPRS are evident for operators; IPv6 offers a solution, but telcos do not necessarily have the experience in IPv6 and address space acquisition and allocation.

There should be some consultation with RIPE NCC to ensure telcos are able to get the address space appropriate for their needs.

Many future events are planned, including a health applications meeting, an "Internet Fiesta", an ISP and web hosting event, and a dedicated IPv6 show (in June 2003). The TF plans to meet every 6 weeks, with two focused topics for each meeting.

The TF could benefit from support from public authorities. We should be positive – we can build IPv6 systems now, but we need to exchange ideas to build projects. We should target web and application hosters, i.e. target the servers before the clients

## 11. Other National IPv6 TF reports (various)

A number of national activities were very briefly presented.

In Finland there have been some meetings. The academic research network Funet has migrated to dual-stack operation already. A meeting is planned with Nokia, to discuss IPv6 in mobile networks. A total of 15 specific transition issues have been identified and is being updated each meeting. A copy will be circulated to the TF.

The UK TF has had three meetings now, and most recently a very good evening event on 16<sup>th</sup> January 2003, where over 200 people showed up to an evening of seminars by five speakers on general, business, vendor and academic issues. The attendees will be followed up to bolster UK TF membership and interest.

ETSI holds many IPv6 interop events and is very active in IPv6. Three "plugtests" have been organised to date, the next being hold in Madrid, 12-14 May 2003, followed by another one in September 22-26, 2003 in Brussels with support from ULB and the Belgian IPv6 TF. New tests are being defined. ETSI is also involved in the IPv6 Forum's "IPv6 Ready" programme.

The German IPv6 TF has had an initial meeting and is building its roadmap document. A Conference is planned for September 2003. The German TF has produced a document describing IPv6 deployment issues; these include:

- Firewalls (personal and company)
- Gatekeepers
- Print servers and other embedded devices
- DNS (see above)
- Multihoming
- AAAv6
- Native IPv6 network management
- Performance issues

Other observations:

- The Symbian v7 OS in the Ericsson T800 phone includes full IPv6 support. The first IPv6-capable phones should soon be in the market.
- HP Openview is expected to introduce IPv6 support in early 2003.

## 12. Benchmarking IPv6 (José Joaquim Fernandes, EC)

We should measure and monitor our progress in IPv6 deployment in Europe. To do so, we need to identify the key performance indicators, e.g.

- Number of IPv6 systems
- Number of IPv6 SubTLA allocations
- Number of native IPv6 (dual-stack) research networks
- Number of native IPv6 (dual-stack) commercial ISP networks
- Number of IPv6-ready operating systems and routers
- Number of vendor-independent IPv6 training courses
- Percentage of IPv6 traffic compared to IPv4
- Number of households with IPv6 access

These are not necessarily ideal benchmarks; these should be discussed and refined. From FP5, we could gather contributions from 6LINK, the IPv6 Cluster, Eurov6, etc, while in FP6 a support action for “IPv6 indicators” may be a useful project. Jordi has accepted to work on this as a Specific Support Action project with contribution from some TF members.

There could be some cooperation with ISOC for education and training.

There was some concern on adverse effects of measurement, if “arbitrary” targets are not met by 2005.

Other statistics may be available, e.g. from the ITU.

### **13. Close of Meeting**

The meeting was closed at 4.30pm. Latif Ladid thanked UCL for their hospitality, including the provision of Wireless LAN Internet access for the meeting.

Actions arising from the meeting are detailed in Annex C.

The next meeting date is to be decided, probably at the end of April 2003 or the beginning of May.

#### 14. ANNEX A: 2<sup>nd</sup> IPv6 TF Phase II Meeting Attendance List

<b>Attendee</b>	<b>Organisation</b>	<b>Country</b>
Patrick Cocquet	6WIND	France
Peter Hovell	BT Exact Technologies	UK
Martin Harris	CESG	UK
Jordi Palet	Consulintel	Spain
Juergen Rauschenbach	DFN	Germany
José Joaquim Fernandes	EC	Belgium
Scott Moseley	ETSI	France
Philippe Cousin	ETSI	France
Latif Ladid	EC IPv6 TF	Luxembourg
Pedro Veiga	FCCN	Portugal
Timo Leppinen	Ficora	Finland
Wolfgang Fritsche	IABG	Germany
Patrik Fältström	IETF	Sweden
Christian de Larrinaga	ISOC UK	UK
Alberto Escudero	KTH	Sweden
Dick Schefstrom	LTU	Sweden
Ger van den Broek	Philips	Netherlands
Bosco Fernandes	Siemens AG	Germany
Rosa Delgado	SITA	Switzerland
Olaf Bonness	T-Systems	Germany
Peter Kirstein	UCL	UK
Paul Van Binst	ULB	Belgium
Diego Vasconcelos	UMIC	Portugal
Florian Baumgartne	UNIBE	Switzerland
Tim Chown	University of Southampton	UK
Rosette Vandenbrouke	VUB	Belgium

## 15. ANNEX B: Agenda 2<sup>nd</sup> IPv6 Task Force Phase II Meeting

**17<sup>th</sup> January 2002**

**UCL, London, UK**

09:00 Welcome and introduction

09:10 IPv6 TF Steering Committee update and NAv6TF update

09:20 Statement of issues and discussions

IPv6 security, IPsec and privacy (Latif Ladid, chair)  
PKIv6 (Jordi Palet, Consulintel)  
IPv6 deployment (Peter Hovell, BT Exact)  
Impact on applications (Patrik Fältström, invited speaker)  
IPv6 DNS (Tim Chown, Uni. Southampton)  
Other issues

10:30 Break

10:45 National IPv6 Task Forces

Case study: French IPv6 TF (Patrick Cocquet, 6WIND)

12:30 Lunch break

13:30 National IPv6 Task Forces

Discussion

15:00 Thinking ahead and strategic direction

Benchmarking IPv6 and 2005 Forecasting (José Joaquim Fernandes, EC)

The next milestones

16:00 Close

## 16. ANNEX C: 2<sup>nd</sup> IPv6 TF Meeting Phase II Action List

These actions require investigation and/or reporting towards IPv6 deployment in Europe. The IPv6 TF can make recommendations and position statements on these issues, but many are beyond the scope of the TF's remit, and can thus only be "non binding" recommendations.

Ref	Action	Responsible	Due date
A.1	Investigate issues for deployment of IPv6-based EC web services (accessibility to EC information over IPv6, including by dual-stack). If technical problems exist, report them back to the IETF v6ops WG	All	2003-04-01
A.2	Consider and then publish joint research plans with Japanese IPv6 Promotion Council established after EC delegation visited Japan in December 2002	All	2003-04-01
A.3	Contribute recommendations to the Global IPv6 Showcase project	All	2003-04-01
A.4	Track and promote the IPv6 Forum "IPv6 Ready" programme to European vendors and industry	All	Ongoing
A.5	The TF should draw up its recommendations to the IETF on an appropriate timescale to wind down the 6Bone experimental network	All	2003-04-01
A.6	Methods should be considered to encourage ISPs to offer IPv6 services over existing IPv4 links, so that customers can gain native IPv6 access over the same link as their existing IPv4 access	All	Ongoing
A.7	Encourage vendors to offer IPv6 security products, including IPv6-capable firewalls	All	Ongoing
A.8	TF position paper on best practice for deployment of secure IPv6 routers and firewalls in the absence of site NATs	All	2003-04-01
A.9	TF position paper on the outstanding IPv6-specific privacy and security issues, and how the privacy issues impact on EU legislation, current or future. (Max 3 pages)	Alberto Jordi Patrick Wolfgang	2003-04-01
A.10	TF position paper on outstanding IPv6 DNS issues (one page)	Tim Patrik F Peter H	2003-04-01

A.11	TF position paper on IPv6 PKI deployment issues (short paper)	Jordi	2003-04-01
A.12	TF position paper on IPv6 ISP deployment status and hurdles (one page, six key issues)	Peter H	2003-04-01
A.13	TF Position paper on international IPv6 routing stability issues (one page)	Tim	2003-04-01
A.14	Finnish TF to circulate its "IPv6 deployment issues" document to TF members	Timo	2003-03-01
A.15	The TF should liaise with telco operators and RIPE NCC to ensure the telcos gain the appropriate IPv6 address space for their needs, and end users get appropriate delegations (/48 or /64).	All	Ongoing
A.16	The TF should revise its roadmap documents on a regular basis (e.g. after each TF meeting)	All	Ongoing
A.17	Investigate a Specific Support Action proposal under the open FP6 call, to undertake an "IPv6 Measurement" project	Jordi	2002-04-15

**17. ANNEX D: Document List**

<b>Title</b>	<b>Source</b>	<b>Date</b>	<b>Doc. N.</b>
eEurope 2005: An information society for all (Text of the communication)	EC	28/05/2002	1
eEurope 2005: An information society for all (Executive summary)	EC	28/05/2002	2
The Second Phase of the IPv6 Task Force	EC	16/07/2002	3
Agenda - IPv6 Deployment Task Force - Phase II	IPv6 TF-SC	12/09/2002	4
Moving Forward With IPv6	EC & IPv6 TF-SC	12/09/2002	5
Welcome & Introduction	EC	12/09/2002	6
IPv6 TF - SC - the Way Forward	Latif Ladid	12/09/2002	7
Japan IPv6 Promotion Council	Kosuke Ito	12/09/2002	8
Country IPv6 TF Case Study – Spain	Jordi Palet	12/09/2002	9
IPv6 ISP Business and Technical Case Study	Peter Hovell	12/09/2002	10
IPv6 Security & Privacy	Latif Ladid	12/09/2002	11
IPv6 in the Home Makes Sense	Tim Chown	12/09/2002	12
Belgian IPv6 Task Force	Paul Van Binst	12/09/2002	13
IPv6 Task Force France	Patrick Cocquet	12/09/2002	14
UK IPv6 Task Force	Tim Chown	12/09/2002	15
Building Trust and Confidence One Step at a Time	Urs E. Gattiker	12/09/2002	16
IPv6 Plans in ESA Telecom	Frank Zeppenfeldt	12/09/2002	17
IPv6 made sexy	Dick Schefström	12/09/2002	18
Minutes of the 1 <sup>st</sup> IPv6 Task Force Phase II Meeting	IPv6 TF-SC	12/09/2002	19
Agenda: National IPv6 Task Forces Meeting	IPv6 TF-SC	17/01/2003	20
New Security Services Based on PKI	Jordi Palet	17/01/2003	21
IPv6 Deployment	Peter Hovell	17/01/2003	22
IPv6 From an Application Layer Perspective	Patrik Fältström	17/01/2003	23
IPv6 Deployment "Missing Pieces"	Tim Chown	17/01/2003	24
IPv6 Task Force France	Patrick Cocquet	17/01/2003	25
Benchmarking IPv6 and Forecast by 2005	EC	17/01/2003	26
Minutes of the 2 <sup>nd</sup> IPv6 Task Force Phase II Meeting	Tim Chown	09/10/2003	27