



European Commission
IPv6 Task Force

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Fifth IPv6 Task Force Phase II meeting

1. Opening of the Meeting

This meeting was a joint meeting of the EU IPv6 Task Force and the IST IPv6 Cluster.

Mat Ford, the chair of the IST IPv6 Cluster, opened the meeting at 10.10 am, describing the agenda to follow. This is the 10th meeting of the IST IPv6 Cluster, and the 5th meeting of the IPv6 Task Force Phase II.

Slides from the presentations are available on the IST IPv6 Cluster (www.ist-ipv6.org) and EU IPv6 Task Force (www.eu.ipv6tf.org) web sites.

[Q = Question, A = Answer, C = Comment]

2. Participants

The attendance list is shown in Annex A.

3. Agenda

The approved agenda is presented in Annex B.

4. Welcome and Introduction (Mat Ford, BT Exact, IPv6 Cluster Chair)

Mat Ford gave an overview of the status of the IST IPv6 Cluster and its activities.

Today's agenda is set to be an interactive meeting, to discuss challenges in IPv6 research, and recent results from projects.

5. IST IPv6 Cluster Activity (Mat Ford, BT Exact, IPv6 Cluster Chair)

The Cluster recently produced the "Moving to IPv6 in Europe" book, released at IST 2003. It also continues to release IPv6 Standardisation reports each 4 months, and news articles from around the world (replacing the original newsletter concept). These reports are available on the Cluster web site (www.ist-ipv6.org). Jordi Palet circulates news links from the Cluster site on a regular basis to the Cluster mail lists.

The Cluster has two mail lists. The ipv6cluster@ist-ipv6.org mail list has several hundred subscribers, for general IPv6 interest. The projects@ist-ipv6.org mail list is for official designated representatives of IST projects only.

The list of projects has been sanitised on the Cluster web site; a couple of projects that were not engaged in IPv6 work have been removed. The new projects are expected to be added when negotiations are completed. Project deliverables are being added (links to them).

In December 2003 there were 1,400 unique visitors to the Cluster web site. Its Google ranking is improving through linkage from other web sites.

The IPv6 Cluster has contributed to the EC Global Service Launch event (15-16 January 2004).

The next book will focus on IPv6 and broadband, but have broad scope and is being put together at the time of writing.

Forthcoming events include

- EuroIndia 2004 (New Delhi, March 2004)
- INET 2004 (Barcelona, May 2004)
- 6NET Conference/Eurov6 event (Brussels, May 2004)
- TERENA Networking Conference (Rhodes, June 2004)

The 6NET and Euro6IX web sites (www.6net.org, www.euro6ix.org) have a calendar of IPv6-related events.

6. IPv6: Toward the Real-Space Internet (Hiroshi Esaki, WIDE Project, Japan)

Hiroshi reported on the research issues for IPv6 in the Asia Pacific region.

IPv6 will be used to network everyday “real space” devices, e.g. cars, home appliances, etc.

Scalability is a significant challenge for research.

Some important support for IPv6:

- Sony will have all products IPv6-enabled by 2005.
- The US DoD will procure IPv6-capable devices now, and run IPv6 by 2008.
- The Chinese government is supporting the CNGI, with applications like VoIP/WiFi with IPv6 one goal.
- The Korean government is very serious about IPv6, as are companies including Samsung.

We need IPv6 support in platforms and applications. Interoperability is an important issue, through the IETF, referenced implementations like KAME, ISC and USAGI, conformance tests like TAHI, UNH-IOL, Connectathon, ETSI Plugtests, Moonv6, and test-bed operation like Abilene, 6NET, Euro6IX, JGN/WIDE. Specific areas are important like DNS and transition/integration of IPv4/IPv6.

Some changing concepts/paradigms:

- Fixed devices move to become portable
- Return to p2p model from client-server
- Multiple sources generating information, with high transmission cost compared to computation cost (e.g. sensor networks)
- Service aggregation/convergence
- New firewall operational models, e.g. end-to-end security
- With moving objects, devices in a local system will have global IDs not local IDs

“Real space” examples include building management systems, transport systems, healthcare, where there may be direct value in making information from globally connected Internet devices available, or indirect benefits from access to the information.

Mobile IPv6 and network mobility will open new opportunities for applications, e.g. buses in Tokyo, and subway systems in Hong Kong.

Sony is building video chat on the PS2 gaming console.

Nokia is using MIPv6+IPsec+RFID+WLAN in a new PDA.

We need global standards for radio frequency for all industries (e.g. sensor, actuator), and for embedded systems (robust operating system, robust architecture, energy saving technology, distributed data processing and a scalable information retrieval architecture).

In Japan, MIPv6 is being seriously considered for most of the wireless activity.

Q: Is MIPv6 included in 3GPP? Is it better to use SIP mobility than MIPv6?

A: It seems 3GPP will use IPv6 for the address space and in the IMS (multimedia subsystem), while 3GPP2 started later and may include MIPv6.

7. New Cluster Projects (Mat Ford, BT Exact, IPv6 Cluster Chair)

NOMAD (from FP5) is doing IPv6 manet routing protocols. See www.ist-nomad.org.

SEINIT is a new FP6 project majoring on security. The kick-off meeting was held in December 2003. There is a heavy focus on IPv6. See www.seinit.org.

MUSE is an FP6 project on multi-service access everywhere and IPv6 home networking. The project is being led by Alcatel.

8. The Future Home project (Heikki Pentikainen, VTT)

The project is using WLAN, IPv6 and is looking at technologies like uPnP, HAVi, CAN and PLC, and ambient intelligence including a rule-based event handling system for home automation.

The key achievements include establishing a stable wireless home IPv6 environment with external connectivity, using different off-the-shelf stacks including Linux (Debian, Red Hat, Familiar), MS Windows, Pocket PC and Symbian.

Interoperability includes IPv4, uPnP between IPv4/IPv6, dual-stack, HAVi (Home Audio Video initiative), CAN (car area network) and PLC.

The project shows how NAT problems can be removed. Applications and protocols (uPnP) need to be modified to work with IPv6. Dual-stack operation for terminals and networks will be common for some time. New services are important with added value for home users, e.g. intelligent networked appliances and external services.

The project finishes in March 2004.

The uPnP Forum and the Digital Home Working Group are looking at standardisation of home networking protocols. The DHWG has IPv6 on the roadmap for 2005/06. It is disappointing that IPv6 was not included there from the beginning.

9. Athena project (Sathya Rao, Telscom)

This new project is developing infrastructures for broadband access, under FP6. It is a STREP (small, focused research project under IST funding) starting in January 2004.

Athena proposes the use of DVB as a “common Ethernet” for making services available to home users with DVB receivers. Downlink is up to 30Mbit/s, with uplink of 2-8Mbit/s, depending on the access network. Thus 60 channels could offer up to 1.8Gbps.

IPv6 over DVB is being worked on in the IETF (in a proposed ipdvb WG), and also in the DVB Forum.

The right-of-use of frequencies is an important issue, to get common frequencies to use.

Thales has an IPv6-over-DVB product available for lab testing.

Mobile devices with compact aerials are being developed.

The project is led by NCSR Demakritos of Greece.

10. NGN LAB project (Sathya Rao, Telscom)

Sathya gave an overview of the achievements of the NGN LAB project, which finished in December 2003.

The project had two test-beds in Brussels and Basel, focusing on IPv6 and QoS, interconnected over GÉANT (the pan European research network) and its predecessors (through BELNET, the Belgian national research network and SWITCH, the Swiss national research network).

The test-beds were available for use by IST and other projects.

Test suites were made available for ETSI Plugtests, e.g. for DHCPv6, OSPFv3 and Diffserv.

An IPv6 intrusion detection systems (IDS) was deployed in Basel (based on the snort open source package).

The iperf package was used for performance and Diffserv testing.

The project collaborates closely with the Eurov6 project (which finishes in June 2004).

Two key events were the April 2003 Swiss IPv6 TF kick-off meeting and the September Plugtests event in Brussels, both of which attracted around 200 attendees.

See www.ngnlab.org for the deliverables.

A follow-up project called EuroLabs was submitted in the 2nd FP6 call, including two new test labs in Nice and Budapest.

11. 6POWER, Euro6IX and 6QM (Jordi Palet, Consulintel)

Jordi gave an overview of these projects.

Key results include demonstration of:

- PKIPv6 and VPNs
- Several code porting activities
- IPv6 videophone
- Commercial PLC (power line communications) with QoS

Challenges include:

- Transition and integration/coexistence
- Ambient intelligence
- ITS (Intelligent Transport Systems)
- New security frameworks

Pressing issues include:

- Multihoming
- Applications
- Business models
- IPv6-enabled devices
- Native IPv6 access (low cost routers, ISP offerings, etc)

12. Cluster Discussion

The projects had been asked to consider:

- The scope of their IPv6 work
- Their key IPv6 results
- The key challenges ahead
- What IPv6 issues are considered to be the most pressing issues

C: The IETF multi6 WG is studying multihoming problems. Things are moving, with a new chair. Two design teams are active. The very hard problem is keeping established connections, but this is not always required. Some simpler solutions exist for some multihoming functionality.

C: Business cases are not always relevant – some issues are commercial, some are technical.

C: One approach is to deploy IPv6 in an ISP and in homes to determine what, if anything, is missing.

C: For the ISP, low cost home routers are an issue.

C: Multicast IPv6 may be important for ISPs for content distribution. You would not bill end users per byte, but bill content providers by the number of end users the ISP can distribute content to. Intra-domain Multicast is good. Digital rights management is an issue. You could use near video-

on-demand (VoD) to the home, and VoD in the home. The same applies to MP3 (music file) distribution.

C: Inter-domain QoS is an issue, but not an IPv6-specific one.

C: End-to-end security is also a big issue. Current security is network-network, generally. How will home users be able to configure access and security measures? The next Windows XP service pack will introduce the Internet Connection Firewall by default, which will get users accustomed to host security.

C: IPsec is not yet implemented widely in IPv6 nodes, despite it being a requirement for a full implementation of IPv6 (see RFC2460). The US DoD initiative will cause this to be addressed more quickly.

C: Telemarketing/spam will be an issue for new technologies like SIP, where it is now a problem for email. Will we require that we can filter out all but desired signed/authenticated content? Reader restrictions on documents will probably happen for digital rights management.

C: SEINIT will investigate appropriate levels at which to apply security (the choices are numerous).

C: IPsec is not always required. Bandwidth may be a problem if limited. Encryption can also be applied at layer 2 in some (e.g. military) networks.

C: Sensor networks require end-to-end connectivity, but in many applications only need to periodically send out information (e.g. to save power). Requirements are application-dependent.

C: Direct device access would be useful for troubleshooting.

C: Removal of NAT simplifies the management of the network, which is useful for ISPs.

13. IPv6 TF Welcome (Latif Ladid, IPv6 TF Chairman)

Latif re-opened the IPv6 TF part of the meeting at 2.00pm.

14. Moonv6 (Jim Bound, NAv6TF, Chairman)

Jim described the results of the Moonv6 test-bed Phase I operation, and plans for Phase II.

The JITC Advanced Technology IP Laboratory and UNH-IOL lab at the University of New Hampshire (non profit, funded by commercial industry) were used. The UNH IOL tests 15 technologies including IPv6.

Actual test results were not disclosed, to avoid fears of vendors not attending in case bugs are found. Of course, a key reason is to find interoperability issues and bugs and to overcome/fix them. This is happening.

Phase I used Abilene and the DREN (US military network), spanning coast to coast in the US (NASA in the west, multiple sites on the East including Fort Monmouth, NJ and SPAWAR, SC). There were 25 vendors and 80 servers. This was (is) a significant IPv6 test-bed.

As of Phase II, the test-bed will be up continuously, including sites such as NASA. There will be international linkage, and connectivity can come in via portals, e.g. European sites via GÉANT and Abilene. DREN was a portal from the JITC to Abilene. Moonv6 was cheap for participants (\$2K per vendor); the network was already in place so it was cheap to run (no government funding required or desired).

The final design tested core protocols, and included dual-stack transition, multi-homed topology, BGP route aggregation and hierarchical addressing design, and point-to-point addressing schemes (/64 vs longer prefixes).

Multihoming is important. Tests of multihoming at site exit routers will be run (as per RFC3178); Abilene is interested in these tests.

There were some things missing in OSPFv3 discovered by the DoD staff (Major Dixon).

Elmic, Solaris, 6WIND and HP/UX were the only IPsec vendors at Moonv6 – the only black mark, but this has been good in highlighting a need from vendors.

There has been a lot of good press from Moonv6 showing that IPv6 is indeed available for use, and cheaper to deploy than might be expected by some.

Q: We need a large customer like the DoD in Europe.

Q: What is happening from the NATO perspective?

A: The various DoD/MoD organisations are starting to pick up, including the UK and Germany. There are extensive NATO test-beds; these could be hooked into 6NET/GÉANT/etc perhaps. We could bridge 6NET and Abilene into Moonv6, with a European NATO portal via 6NET, perhaps using end-to-end encryption.

Q: Is the DoD happy to use global addresses? Presumably it uses RFC1918 for IPv4?

A: Moonv6 is not just DoD, it is multi-vendor and open. They are OK with global addressing, as they need end-to-end for the war-fighter – the last mile to the soldier in harm's way. That is the target and the point, so it must be end-to-end, so cannot be NAT or private addressing.

15. IPv6 and privacy (Alberto Escudero-Pascual, KTH)

IPv6 brings unique opportunities for privacy that IPv4 does not have, e.g. CGA (cryptographically generated addresses) or RFC3041 (privacy extensions).

The u bit of an IPv6 address under RFC3041 makes privacy addresses look different from normal statelessly autoconfigured addresses. Thus the use of privacy is visible.

Using a constant home address such that a node can be continuously addressable by a static address is a threat for privacy as third parties may be able to look at the mobility header to see the care of and home addresses, and form correlations.

Hiding your mobility from intermediate routers and the correspondent node is difficult, especially when wishing to maintain security associations.

NTT DoCoMo are looking at cryptographically protected routing prefixes to mask prefix changes inside an autonomous system from external nodes, so that nodes do not appear mobile. This involves prefix rewriting at network boundaries, and is only possible in IPv6.

C: The IETF is the place to address these sorts of concerns.

C: There are some IPR issues with CGAs.

C: Intrusion detection is going to be important.

16. IPv6 Barriers (Mat Ford, BT Exact)

Mat reviewed the issues as presented in the previous meeting by Peter Hovell of BT Exact. These are not barriers for BT Exact, rather barriers collated from the IPv6 TF's discussions with various players.

The barriers are both technical and non-technical.

Technical issues include:

- Multihoming
- IPv6 access network equipment
- Network management
- Host OS support
- IP version-neutral applications
- DNS infrastructure
- Security (end to end)
- User-Network Interface: UNI (including configuration for typical users)
- Site-local address resolution

Non-technical issues include:

- Certain commercial powers-that-be like users to be consumers not suppliers
- Users do not understand or care about the technical issues like NAT
- Business cases (lack of) – make or save money
- Charging for multiple static IPv4 addresses
- Bandwidth costs for VoIP higher for IPv6
- Perception of NAT as a security technology
- Perception of p2p as a copyright infringement technology
- Core network infrastructure replacement cycles
- Training required: engineers, customer support, marketing
- Lack of awareness among those who could benefit from IPv6

C: Greenfield deployments, e.g. the Chinese research network, allow easier IPv6 deployment in a way.

C: Only IPv6-capable products should be bought; that would ease later transition.

C: France Telecom is announcing IPv6 service in the core and access networks in 2004 at the EC Launch Event

17. European IPv6 TF statuses (Jordi Palet, Consulintel)

Jordi summarised the National IPv6 Task Force achievements, common barriers and future plans.

See the presentation on the IPv6 TF web site for details (www.ec.ipv6tf.org).

There are now 12 national TFs that are running, with more to follow (Austria, Ireland, ...).

18. Asia Pacific IPv6 status (Hiroshi Esaki, WIDE)

Hiroshi repeated a summary of his morning's presentation.

There are many plans for future activity in the region, including:

- R&D collaboration between China, Korea and Japan.
- Test-bed development, including Mobile IP
- Sharing of experience on deployment barriers and show-stoppers
- Encouraging the private sector
- Gaining serious transition experiences

19. NA IPv6 TF status (Jim Bound, NAv6TF, Chairman)

The North American IPv6 TF is fairly new and is taking a market perspective on IPv6, providing a centre of expertise. It is a totally volunteer group, with modest goals, and not asking for funding.

The major success is waking up the DoD for IPv6. The next target is the US Department of Commerce (DoC).

Moonv6 is a major test-bed – see www.moonv6.org.

A key message is IPv6 transition, not migration, as both protocols will co-exist for some time.

The next NAv6 TF summit is June 2004 in Santa Monica, California.

20. IPv6 Media/Video production (Mario Martinoli, Research Channel)

The project is making videos about IST projects.

The audience is the general public, and thus not a technical one. IPv6 is one of the selected topics in the IST research area for production of video media. Two videos will be made, covering some of the IST research on IPv6.

21. Open TF Discussion

Q: Are there DNS issues with IPv6 registrations for DNS servers for registries?

A: In France AFNIC has a fully operational IPv6 DNS service. You can register IPv4 or IPv6 addresses. It could be done as a RIPE document. The root servers are in process working with

ICANN to make the glue happen. The reality is that domains will have IPv4 and IPv6 registrations; IPv6-only registrations are unlikely. Many engineers are working well on this issue. The issue does not stop early deployment now.

Q: What about the 512-byte UDP DNS response issue?

A: There is work being undertaken to work around that issue.

C: There are operational issues perhaps more than technical issues.

C: Saying the host OS support as an issue means the varying level of functionality in host OS's, e.g. whether IPsec is supported or not. The terminology in the "barrier" list needs to be carefully written in that respect.

C: Any MIB issues should be fed back to the IETF (e.g. accounting for split IPv4/IPv6 traffic).

A: Cisco is developing their solution; the important thing is to have a complete management architecture; it's probably 12-18 months away. 6NET has shown the volume of tools that are available for the NRENs (national research and education networks) for IPv6. It shouldn't prevent people going ahead. It is really a MIB implementation issue. Cisco's Netflow is ready.

A: The MIBs are being done; HP OpenView is being done. A list of specific requirements for management would be useful for vendors. A technical list isn't enough; the business unit also needs to understand the requirements. Moonv6, WIDE and 6NET should share their lists of requirements and tools being used.

C: Open source tools could be developed for IPv6, as has been done for MRTG as an example.

C: The important thing technically is that solutions are being worked on in some way; more important are the commercial barriers. While RIPE is saying there are 20 years worth of IPv4 addresses available, companies will not see a requirement for IPv6.

C: Articles like the Wall Street Journal feature on IPv6 which had some negative points will now get responses from vendors, who have a vested interest. IPv4 is like a run down car that you should really replace; you need to make the purchase of the new car more palatable. End-to-end is the most palatable aspect of IPv6.

C: Journalists are now aware of IPv6 and ask questions; that is good.

C: Regarding DNS, getting .fr to IPv6 is important to then approach the government to introduce IPv6 for .gov.fr.

C: We should market Eva Castro's work on IP independent APIs and application development.

C: We should remember that even projects like Euro6IX are still small-scale demonstrators; real commercial deployment requires validation on a much larger scale. We must be open in producing a complete list of IPv6 issues for deployment.

C: NTP needs to be done. The specification needs to be changed. The public domain code is out there; we need to fix that.

Q: Where are we with IPv6 in cable/DSL routers?

A: It is being worked on. Even when it arrives, the ISP has to give it an address and connect it. We need a mission to speak to Netgear and Linksys type companies and ensure IPv6 is on their agendas to be ready for the native DSL and broadband services from the ISPs. Some Asian developers are already beginning to produce this equipment. Cheap products can only come with a market; the ISP support is needed.

C: "Barrier" is not a good term; many features are not required for IPv6 integration in a dual-stack network. "Challenges" is perhaps a better phrase.

Q: Do we need a business case that goes around the ISPs, e.g. through 6to4?

A: In Japan the building automation business is a good case, that is moving to IP technologies, so they want a unified technology rather than a proprietary solution; the same with cars and aviation industries.

C: IPv6 needs certain forces to move to happen, but we should not stop being critical of NAT. People mistake NAT for filtering. Filtering is not bad. NAT is.

C: IPv4+NAT with IPv6 dual stack is a real deployment reality. This would use new IPv6 applications.

C: An open discussion about transition architectures would be good, e.g. reliance on 6to4 or Teredo which prefer to speak to other 6to4 or Teredo nodes, rather than native IPv6 hosts.

C: We need examples of things that can be done in IPv6 that cannot be done in IPv4. An example would be a secure end-to-end p2p network or mesh network, for file exchange. This may not be "politically correct" (e.g. for piracy concerns) but would be interesting for many people.

C: End-to-end may be seen as a risk; but banning it in the US it would probably be an infringement on the 1st and 4th Amendment for example.

C: NAT is preventing applications from being developed. NAT helped save the Internet at the time; but now it is a disease preventing growth.

C: NAT is a problem for operators because it is more complex to find the information about users of the network for accountability issues; they may be legally obliged to track usage, so making it easy by removing NAT helps.

C: We need to find a balance between privacy and accountability.

C: A key result from today is that there is a lot of knowledge that should be shared between the North American, European and Asia Pacific regions on IPv6 experience.

C: The INSC project (NATO) is doing mobility and security, but is naturally secretive about its work and results. We should try to harness them as well. Moonv6 Phase II begins soon, so it may be timely to consider. Germany and France now share the DoD procurement rule, although it has not been publicised. INSC has resources for people but not capacity, so working with Moonv6 would be good.

C: There could be an IPv6 portal to Moonv6 anywhere, including to INSC. The DoC will put out a request for comments for IPv6 adoption that the EU should respond to. We need a world vision.

C: There may be issues using IST project resources for defence work. Also, the INSC network may not be reproducible. In France however the INSC is using Renater (IPv6 in IPv6 tunnels, so it is not native directly). Also, INSC uses site-local addresses, because their military network will never have Internet connectivity.

22. Close of Meeting

The meeting was closed at 6:20pm.

The next meeting date is to be determined.

23. ANNEX A – 5th IPv6 TF Phase II Meeting Attendance List

Attendee	Organisation	IST Projects
Outi Alapekkala	Research Channel	IST-TV
Enrico Albertin	Hewlett Packard	-
Marcelo Bagnulo	University Carlos III Madrid	6LINK
Tayeb Ben Meriem	France Telecom	6QM SATIP6, Euro6IX
Jim Bound	Hewlett Packard	-
Tim Chown	University of Southampton	6NET, Euro6IX, 6LINK, IPv6 TF-SC
Peter Christ	T-Systems	IPv6TF-SC, Euro6IX
Patrick Cocquet	6WIND	Euro6IX, SEINIT
Raffaele D'Albenzio	Milan Internet Exchange	-
João Da Silva	EC	-
Rosa Delgado	ISOC	-
Hiroshi Esaki	WIDE	-
Alberto Escudero-Pascual	KTH	-
Bosco Fernandes	Siemens Ag	IPv6 TF-SC
Jose Fernandes	EC	-
Leonardo Ferracci	Telecom Italia Lab	IPv6TF-SC, Euro6IX
Mat Ford	BT Exact	IPv6TF-SC, SEINIT
Wolfgang Fritsche	IABG	SEINIT
Fredrik Garneij	IPcom	
Peter Kirstein	UCL	6LINK, 6NET, SEINIT
Latif Ladid	IPv6 TF-SC chairman	IPv6TF-SC, SEINIT
Timo Leppinen	Ficora	-
Stéphane Masson	ST Microelectronics	-
Mario Martinoli	Research Channel	IST-TV
Michel Mazzella	Alcatel Space	SATIP6
Kevin Meynell	TERENA	6NET, 6LINK
Mario Morelli	Telecom Italia Lab	IPv6TF-SC, Euro6IX
Jordi Palet	Consulintel	Euro6IX, 6LINK, 6POWER, 6QM, Eurov6, IPv6TF-SC
Heikki Pentikainen	VTT	Future Home
Yanick Pouffary	Hewlett Packard	-
Sathya Rao	Telcom	6LINK, Eurov6, Euro6IX
John Ronan	WIT-TSSG	Torrent, SEINIT
Juan Quemada	UPM	Euro6IX, 6LINK
Helga Treiber	Research Channel	IST-TV
Paul Van Binst	ULB	NGN-LAB, 6NET, Eurov6
Ger Van Den Broek	Philips	IPv6TF-SC
Pedro Veiga	FCCN	-
Olaf Wennop	T-Systems	IPv6TF-SC, Euro6IX
Andre Zehl	T-Systems	IPv6TF-SC, Euro6IX

24. ANNEX B - Agenda 5th IPv6 Task Force Phase II Meeting

14th January 2004

10:00 to 17:00

EC Borschette Offices, Brussels, Belgium

10:00 Meeting opens

Welcome and Introduction (Mat Ford, BT Exact, IPv6 Cluster Chair)
IST IPv6 Cluster Activity (Mat Ford, BT Exact, IPv6 Cluster Chair)
IPv6: Toward the Real-Space Internet (Hiroshi Esaki, WIDE Project, Japan)
New Cluster Projects (Mat Ford, BT Exact, IPv6 Cluster Chair)
The Future Home project (Heikki Pentikainen, VTT)
Athena project (Sathya Rao, Telscom)
NGN LAB project (Sathya Rao, Telscom)
6POWER, Euro6IX and 6QM (Jordi Palet, Consulintel)
IST IPv6 Cluster Discussion – Research Challenges (ALL)

13:00 Lunch break

IPv6 TF Welcome (Latif Ladid, IPv6 TF Chairman)
Moonv6 (Jim Bound, HP)
IPv6 and privacy (Alberto Escudero-Pascual, KTH)
IPv6 Barriers (Mat Ford, BT Exact)
European IPv6 TF statuses (Jordi Palet, Consulintel)
Asia Pacific IPv6 status (Hiroshi Esaki, WIDE)
NA IPv6 TF status (Jim Bound, HP)
IPv6 Media/Video production (Mario Martinoli, Research Channel)
Open Debate – The Way Forward for IPv6 Task Forces (ALL)

17:00 close

25. Annex C: List of IPv6 TF-SC Actions arising from Meetings

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.	Jordi	Ongoing
A.2	Consider and then publish joint research plans with Japanese IPv6 Promotion Council established after EU delegation visited Japan in December 2002	Latif	Ongoing
A.3	Contribute recommendations to the Global IPv6 Showcase project	Latif Jordi	Ongoing
A.4	Track and promote the IPv6 Forum "IPv6 Ready" programme to European vendors and industry	Latif	Complete. See also A.18
A.5	The TF should draw up its recommendations to the IETF on an appropriate timescale to wind down the 6bone experimental network	Jordi	Complete. (6Bone phase-out plan finalised)
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	Mat	Ongoing
A.7	Encourage vendors to offer IPv6 security products, including IPv6-capable firewalls	Tim	Ongoing
A.8	TF position paper on best practice for deployment of secure IPv6 routers and firewalls in the absence of site NATs	All	Outstanding
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	Complete
A.10	TF position paper on outstanding IPv6 DNS issues (one page)	Tim Peter H	Ongoing

A.11	TF position paper on IPv6 PKI deployment issues (short paper)	Jordi	Ongoing
A.12	TF position paper on IPv6 ISP deployment status and hurdles (one page, six key issues)	Peter H	Complete
A.13	TF Position paper on international IPv6 routing stability issues (one page)	Tim	Ongoing
A.14	Finnish TF to circulate its "IPv6 deployment issues" document to TF members	Timo	Complete
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).	Peter H Tim	Ongoing
A.16	The TF should revise its roadmap documents on a regular basis (e.g. after each TF meeting)	Andre Latif	Ongoing
A.17	Investigate a Specific Support Action proposal under the open FP6 call, to undertake an "IPv6 Measurement" project	Jordi	Complete
A.18	Produce one page summary of IPv6 Ready programme goals and methodology	Latif	Outstanding
A.19	Produce IPv6 Multihoming short briefing paper.	Tim	Outstanding
A.20	Consult with appropriate European experts on the potential to develop an open source European IPv6 stack.	Latif	Complete (not proceeding)
A.21	Analyse National TF achievements, perceived barriers and planned next steps for commonalities and report them to all TFs	Jordi	Complete
A.22	Identify candidate IPv6 deployment case studies that can be passed to the EC for possible tender for reporting	Latif	Ongoing
A.23	Produce a communiqué recommending the holding of a meeting of national NICs to coordinate IPv6 service support in top level services as per AFNIC	Jordi	Ongoing
A.24	Produce a communiqué recommending the formation of a "technology platform" on IPv6 to investigate barriers, bringing together stakeholders and the public and private organisations and companies.	Jordi	Complete (renewed call)
A.25	Produce a communiqué recommending the creation of an IPv6 adoption measurement and benchmarking framework for Europe.	Jordi	Complete (renewed call)
A.26	Produce a communiqué reinforcing the need for IPv6 knowledge and awareness to be targeted at European SMEs.	Jordi	2003-12-14

A.27	Discuss and then decide how to best recommend the adoption of an “IPv6 Ready” procurement policy for government procurements (in all aspects of state networks including government, health, education).	Latif	Ongoing
A.28	In support of 6LINK, request that the EC reminds IST projects in the IPv6 Cluster to contribute news of significant IPv6 work done in their projects to the Cluster (to the Cluster news site at www.ist-ipv6.org).	Mat	Ongoing
A.29	Select 3-4 key action areas for the IPv6 TF-SC to push during the closing months of the TF-SC project.	Andre	Ongoing
A.30	Investigate means to share experiences between the European, North American and Asia Pacific IPv6 deployment and research groups	All	Ongoing
A.31	Investigate opportunities and methods for Moonv6 to be connected to European networks such as 6NET and Euro6IX	Jordi Tim	Ongoing
A.32	Publish one-page summary of pointers to best practice for IP-independent application development	All	Ongoing
A.33	Publish 1-2 page summary on the status of IPv6 network management and monitoring tools, e.g. citing those used by NRENs in 6NET	All	Ongoing