

Introduction to the Internet Area

IETF94 Yokohama

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What do we want to cover

- Background
- Overview of the working groups
- Brief summaries of the working groups
- Pointers to some of the important documents relevant to the area
- How to find further information?

The Internet Area in numbers

- 19 of the 136 (14%) active IETF working groups
- 31 of the 223 (14%) RFCs published this year
- 2 of the 15 (13%) of the Area Directors

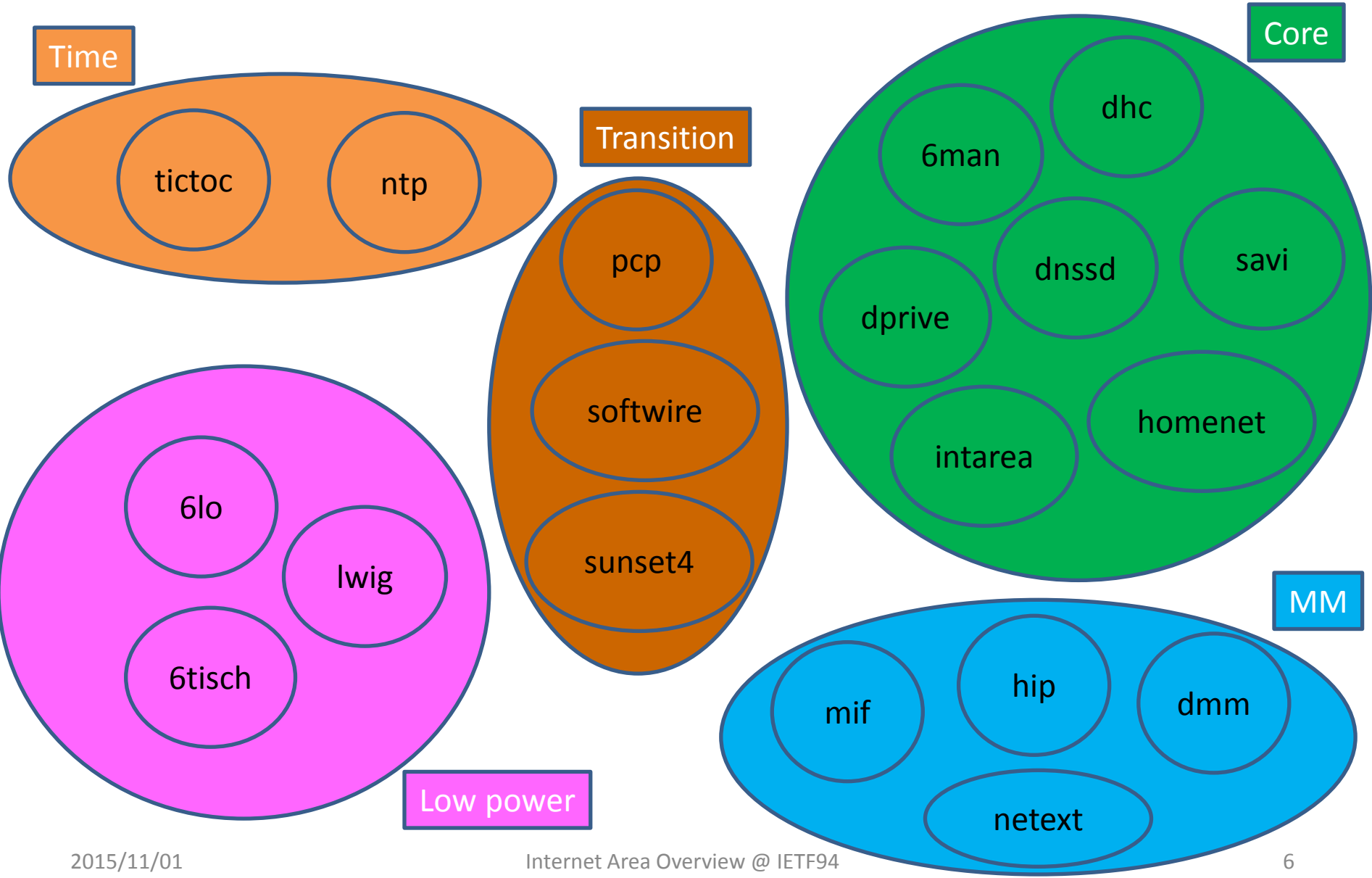
Core Protocols

- IP (IPv4 and IPv6)
- DNS
- DHCP (DHCPv4 and DHCPv6)
- Mobile IP (MIPv4 and MIPv6)
- NTP

Broad technical areas

- Core protocols including IP, DNS, host and router configuration
- Mobility and Multihoming
- IPv4/IPv6 transition and co-existence
- Low power networks and IoT
- Time related protocols

WGs by technology area

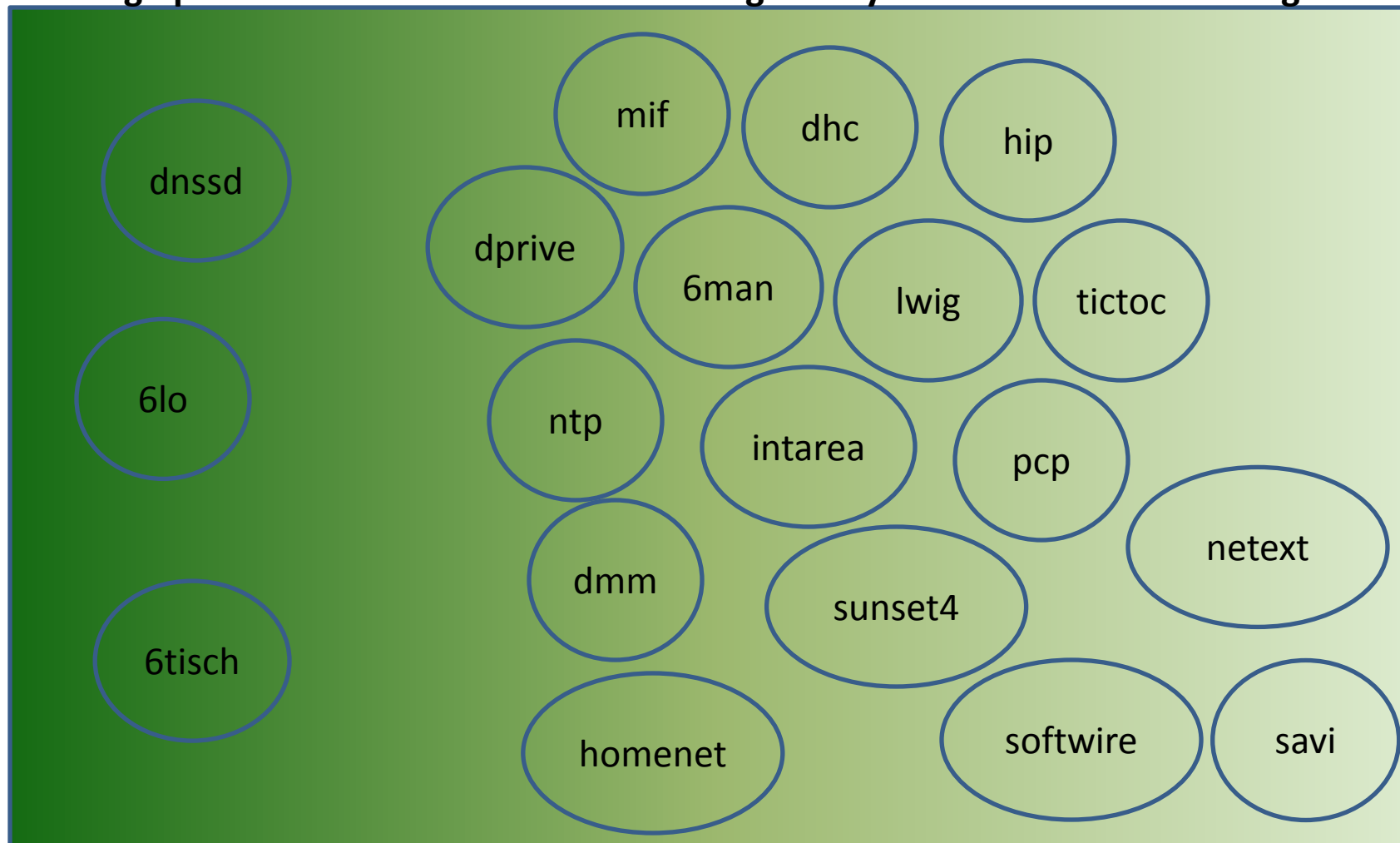


By phase of work

Starting up

Working steady

Winding down



6lo

Low power



IPv6 over Networks of Resource-constrained Nodes

- 6lo focuses on the work that facilitates IPv6 connectivity over constrained node networks
- Main areas of work
 - IPv6-over-[link](#) adaptation layer specifications for link layer technologies used in constrained node networks
 - Information and data models (e.g., MIB modules, YANG models) for these adaptation layers
 - Common mechanisms such as low-complexity header compression, that are applicable to more than one adaptation layer specification
 - Maintenance and informational documents required for the existing IETF specifications in this space (e.g. work from the erstwhile 6lowpan wg)

6man

Core



IPv6 Maintenance

- The 6man working group is responsible for the maintenance, upkeep, and advancement of the core IPv6 protocol specifications
- It is the design authority for extensions and modifications to the IPv6 protocol
- Reviews and signs off on documents produced in other working groups that extend or modify the IPv6 protocol

IPv6 over the TSCH mode of IEEE 802.15.4e

- The IEEE802.15.4e Time-slotted Channel Hopping (TSCH) is a recent amendment to the IEEE802.15.4 MAC
- The 6tisch working group works on defining IPv6 over TSCH in order to enable the further adoption of IPv6 in industrial standards
- Currently limited to working on distributed routing over a static schedule
 - May work on a dynamic schedule in the future

Dynamic Host Configuration

- The dhc working group is one of the oldest working groups in the IETF (Originally chartered in 1991 😊)
- It is tasked with
 - Developing extensions to the DHCPv6 infrastructure as required to meet new applications and deployments
 - Documenting operational considerations for the wider community
 - Maintenance and upkeep of the core DHCP specifications
 - Reviewing DHCP options defined in other WGs in association with the Internet Area Directorate

Distributed Mobility Management

- The dmm working group specifies Distributed Mobility Management solutions for IP networks so that traffic between mobile and correspondent nodes can take an optimal route
- It is also chartered to work on maintenance and bug fixes of the specifications in the Mobile IPv6 protocol family

dnssd

Core



Extensions for Scalable DNS Service Discovery

- The DNS-SD [RFC 6763] and mDNS [RFC 6762] protocol suite (aka Apple Bonjour) is widely used for DNS-based service discovery and host name resolution on a single link
- There are several use cases such as multi-link residential, campus, and enterprise networks where it could be useful to used to discover services on remote links
 - Unfortunately, the mDNS protocol is constrained to link-local multicast scope by design, and therefore cannot be used to discover services on remote links
- The focus of the dnssd working group is to develop a solution for extended, scalable DNS service discovery
 - Document requirements for such a solution under selected scenarios
 - Develop an improved, scalable solution for service discovery that can operate in multi-link networks
 - To document challenges and problems encountered in the coexistence of zero configuration and global DNS name services in such multi-link networks

dprive

Core



DNS PRIVate Exchange

- The dprive working group develops mechanisms to provide confidentiality to DNS transactions, to address concerns surrounding pervasive monitoring
- Primary focus of this Working Group is to develop mechanisms that provide confidentiality between DNS Clients and Iterative Resolvers
 - At a later time the wg may also consider mechanisms that provide confidentiality between Iterative Resolvers and Authoritative Servers
- Attempts to maintain backward compatibility with legacy DNS implementations as well as minimize application-level changes

Host Identity Protocol

- The Host Identity Protocol (HIP) provides a method of separating the end-point identifier and locator roles of IP addresses
- The HIP architecture and protocol mechanisms had been published as Experimental RFCs
 - effects of the protocol on applications and on the Internet as a whole were not known

Home Networking

- This working group focuses on the evolving networking technology within and among relatively small residential networks
 - Designed to work on residential networks involving multiple routers and subnets
 - Mainly focused on IPv6 based operation
- Focused on meeting the following requirements
 - Prefix configuration for routers
 - Managing routing
 - Name resolution
 - Service discovery
 - Network security
- Architectural principles have been specified
 - Protocol work is ongoing
 - Selection of a routing protocol for use in homenet is also ongoing

Internet Area Working Group

- Serves primarily as a forum for discussing far-ranging topics that affect the entire area
 - Share information about ongoing activities in the area
 - Create a shared understanding of the challenges and goals for the area
 - Point of co-ordination
- Also works on development and publication of one-off RFCs that do not justify the formation of a new working group
 - Either not in scope of an existing working group
 - or relevant to more than one INT area working group

Light-Weight Implementation Guidance

- The LWIG working group focuses on collecting and documenting experiences from implementers of IP stacks in constrained devices
 - implementation techniques for reducing complexity, memory footprint, or power usage

Multiple Interfaces

- The purpose of the MIF working group is to describe how devices can attach to and operate in multiple networks
- It works on defining a consistent approach (MPVD – multiple provisioning domains) and recommended practices for handling sets of network configuration objects by hosts attached to multiple networks.
 - The MPVD architecture has been published
 - The protocol extensions to IPv6 neighbor discovery and to DHCPv6 are ongoing
 - Working on an API so that applications can request information associated with specific provisioning domains

Network-Based Mobility Extensions

- Proxy Mobile IPv6, specified in RFC 5213, is a network-based mobility protocol.
- The netext working group is chartered to work on some key extensions to PMIPv6
 - Localized Routing
 - Bulk Refresh
 - Load Balancing and Reliability of the mobility anchors
- Work has mostly been completed and the wg is winding down

Network Time Protocol

- The Network Time Protocol synchronizes clocks across a network
 - It is one of the oldest and most widely deployed protocols on the Internet
- The NTP working group maintains the Network Time Protocol specifications
- Current efforts include:
 - maintenance of NTPv4 specifications (e.g. extension header clarifications)
 - development of Network Time Security (replacement for Autokey)
 - documentation of Best Current Practices
 - development of a YANG module
 - collection of requirements for next steps for NTP

pcp Transition

Port Control Protocol

- Focused on standardizing a client/server protocol to enable an explicit dialog with a middleboxes (e.g. NATs or firewalls)
 - Allows the opening up and/or forwarding of TCP and UDP ports, regardless of the middlebox's location
 - Supports off-link middleboxes (unlike UPnP or NAT-PMP)

Source Address Validation Improvements

- Focuses on standardizing mechanisms that prevent nodes attached to the same IP link from spoofing each other's IP addresses
 - Similar to BCP38 ingress filtering but on a single IP link
- Work has been mostly completed and wg will be closed soon

- Focuses on the specification of IPv4-IPv6 transition and co-existence mechanisms that are based on encapsulation (i.e. tunneling)
 - Discovery, control and encapsulation methods for connecting IPv4 networks across IPv6 networks and vice versa
 - Management mechanisms for these methods (e.g. provisioning, MIBs, RADIUS etc.)
 - Implementation considerations for handling selection and use of one of these transition/co-existence solutions
- Work has been mostly completed and wg will be closed or rechartered soon

sunset4 Transition

Sunsetting IPv4

- Focuses on doing works that facilitates the graceful "sunsetting" of the IPv4 Internet in areas where IPv6 has been deployed
 - Includes identifying specific areas of concern, providing recommendations, and standardizing protocols

Timing over IP Connection and Transfer of Clock

- The Timing over IP Connection and Transfer of Clock (tictoc) working group was chartered to look at next generation time synchronization protocols
 - including the interoperation of IEEE 1588 Precise Time Protocol with IETF Protocols.
- Current efforts include:
 - Security requirements for time synchronization protocols
 - IEEE 1588 Enterprise profile
 - Experimental draft on 1588 over MPLS networks
 - Experimental multipath synchronization technique
 - IEEE 1588v2 management (MIB and YANG modules)

Internet Area Directorate

INT Dir



- The Internet Area Directorate is an advisory group of experts selected by the Internet Area Directors.
- Reviews documents as and when requested by the INT Area Directors.
- Mentor newer IETF participants
 - Identify participants who have the potential to be useful, contributing members to the directorate and
 - Help them with exposure/tutoring from more experienced IETF participants

Closely aligned areas

- OPS
 - IPv6 adoption/transition/co-existence
 - MIB & Yang model development
 - AAA (RADIUS and DIAMETER) support
- RTG
 - Interactions between IP and Routing protocols
 - Home networking
- SEC
 - Security Considerations, DNSSEC, Network Access Control

Pointers to background reading

- IPv4 – RFC 791
- IPv6 – RFC 2460*, RFC 4861, RFC 4862
- DNS – RFC 1035
- DHCPv4 – RFC 2131
- DHCPv6 – RFC 3315
- MIPv4 – RFC 5944
- MIPv6 – RFC 6275
- NTP - RFC 5905

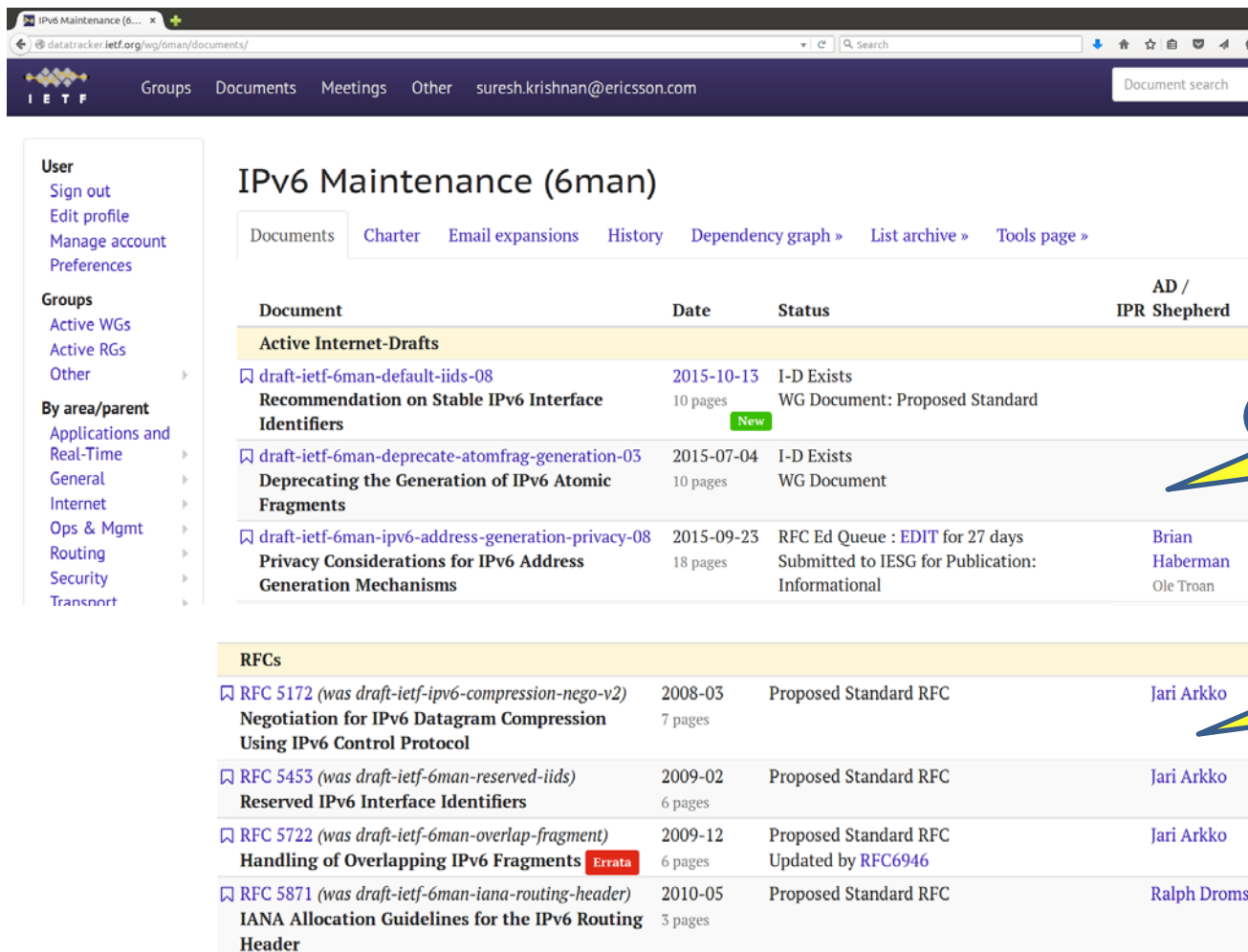


* In the process of being updated

For further information

- Current list of wgs in the Internet Area
<http://datatracker.ietf.org/wg/#int>
- Information about a specific working group
 - Mailing list information and archives
 - Charter, milestones and deliverables
 - Associated documents...http://datatracker.ietf.org/wg/<wg_name>/

Example working group information



IPv6 Maintenance (6man)

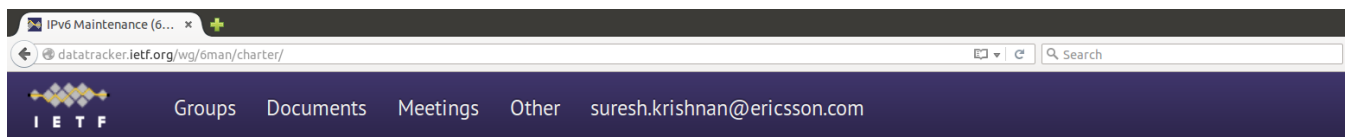
Documents | Charter | Email expansions | History | Dependency graph » | List archive » | Tools page »

Document	Date	Status	AD / IPR Shepherd
Active Internet-Drafts			
draft-ietf-6man-default-iids-08 Recommendation on Stable IPv6 Interface Identifiers	2015-10-13 10 pages	I-D Exists WG Document: Proposed Standard	
draft-ietf-6man-deprecate-atomfrag-generation-03 Deprecating the Generation of IPv6 Atomic Fragments	2015-07-04 10 pages	I-D Exists WG Document	
draft-ietf-6man-ipv6-address-generation-privacy-08 Privacy Considerations for IPv6 Address Generation Mechanisms	2015-09-23 18 pages	RFC Ed Queue : EDIT for 27 days Submitted to IESG for Publication: Informational	Brian Haberman Ole Troan
RFCS			
RFC 5172 (was draft-ietf-ipv6-compression-nego-v2) Negotiation for IPv6 Datagram Compression Using IPv6 Control Protocol	2008-03 7 pages	Proposed Standard RFC	Jari Arkko
RFC 5455 (was draft-ietf-6man-reserved-iids) Reserved IPv6 Interface Identifiers	2009-02 6 pages	Proposed Standard RFC	Jari Arkko
RFC 5722 (was draft-ietf-6man-overlap-fragment) Handling of Overlapping IPv6 Fragments Errata	2009-12 6 pages	Proposed Standard RFC Updated by RFC6946	Jari Arkko
RFC 5871 (was draft-ietf-6man-iana-routing-header) IANA Allocation Guidelines for the IPv6 Routing Header	2010-05 3 pages	Proposed Standard RFC	Ralph Droms

WG Drafts

RFCS

Example working group information



- User**
 - Sign out
 - Edit profile
 - Manage account
 - Preferences
- Groups**
 - Active WGs
 - Active RGs
 - Other
- By area/parent**
 - Applications and Real-Time
 - General
 - Internet
 - Ops & Mgmt
 - Routing
 - Security
 - Transport
 - IRTF
- New work**
 - Chartering groups
 - BOFs

IPv6 Maintenance (6man)

[Documents](#)
[Charter](#)
[Email expansions](#)
[History](#)
[Dependency graph »](#)
[List archive »](#)
[Tools page »](#)

WG

Name IPv6 Maintenance

Acronym 6man

Area Internet Area (int)

State Active

Charter [charter-ietf-6man-04](#) Approved

Personnel

Chairs Bob Hinden
 Ole Troan

Area Director Brian Haberman

Mailing list

Address ipv6@ietf.org

To subscribe <https://www.ietf.org/mailman/listinfo/ipv6>

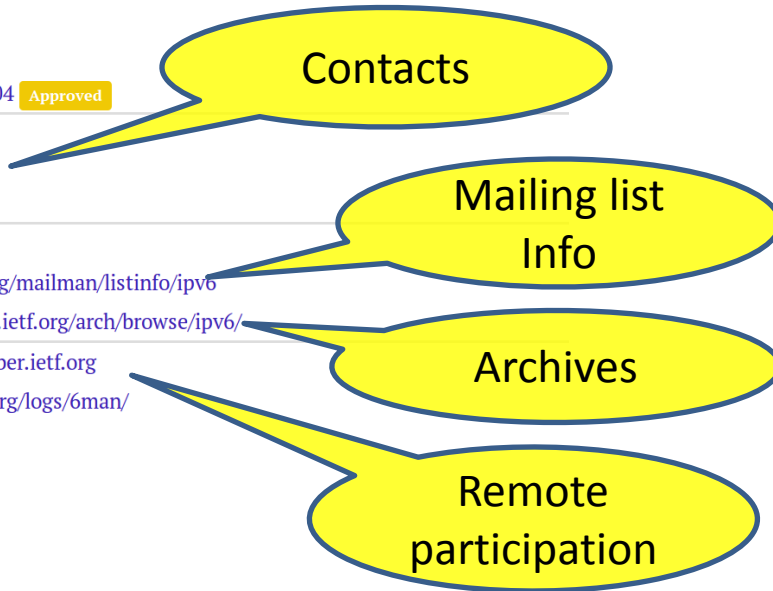
Archive <https://mailarchive.ietf.org/arch/browse/ipv6/>

Jabber chat

Room address <xmpp://6man@jabber.ietf.org>

Logs <https://jabber.ietf.org/logs/6man/>

Charter for Working Group



Questions?



Acknowledgments

- Thanks to Mirjam Kuehne, Karen O' Donoghue, Alice Russo, Brian Carpenter, Scott Bradner and all the wonderful folks on the EDU team for their contributions and feedback

Links

- You can find these slides at
 - <http://wiki.tools.ietf.org/group/edu/wiki/IETF94>
- Please spend a minute to take a survey about this presentation
 - <https://www.surveymonkey.com/r/94internetarea>
 - The EDU team (and I) would love to hear your views