Current technical directions in IETF (with emphasis on wireless)

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Background

- IETF has been doing standards for the wired Internet since late 1980's.
- In mid 1990's, convergence of real time media and data traffic started to become technologically possible (high speed optical networks, etc.).
- IETF started working on standards for Internet telephony then.
- IETF moved into wireless as convergence of real time media and data in wireless has become technologically possible (802.11, 3G, etc.).

Outline

Overview of selected Working Groups focused on wireless/telcom themes.

- Applications Area
- Internet Area
- Operations and Management Area
- Security Area
- Transport Area
- Omitted:
  - Routing Area – not much wireless related.
    - Exception: Ad hoc networking (MANET) but primarily of research interest.
    - Telcom related - Continue work on MPLS.
  - Sub IP Area – not related to wireless, going away soon.
    - Telcom related - Also some work on MPLS, to be moved.
  - General Area – primarily organizational.

Applications Area

Geographical Location Privacy

- Requirements for application level geographical location information:
  - Authorization, integrity, privacy requirements.
  - Transfer between and release to authorized agents.
  - Rules for how location information is used and where it goes, specified by owner of information.
- Select an already standardized format for use in representing location information.
- An example API for application-level access to/management of 3G location information.
- Development of specifications that make security and privacy integral to location information in HTTP and HTML.

Instant Messaging

- Three Working Groups:
  - SIMPLE – extend SIP for instant messaging.
  - XMPP – standardize XML-based protocol with Jabber technology as base.
  - IMPP – interoperability between various IM systems.
- Why three?
  - Instant messaging and presence is a natural extension for SIP.
  - Jabber has a large deployed base, solid technology, but needs security and internationalization yet.
  - Not all devices will have SIP, and not all will have XML (but for instant messaging, you will need one or the other).
  - Some requirements and protocol necessary for interoperability between two, and with other proprietary protocols.
- SIMPLE and XMPP are working to satisfy requirements of RFC 2779 (requirements for IM protocols).

Internet Area

Extensible Authentication Protocol (EAP)

- EAP is an IETF protocol that is heavily used by non-IETF protocols to support multiple authentication methods.
  - 802.1x, 3GPP, etc.
- EAP can also be used in IETF authentication (Diameter).
- Working Group tasks are to clean up and solidify EAP specification.
- Working Group is not currently chartered to standardize new EAP methods.

Mobile IP

- Working group finished Mobile IPv6 specification.
  - Architecturally cleaner than Mobile IPv4.
  - Support for secure route optimization.
  - Better security support between mobile host and home agent.
- Split Mobile IP into three Working groups:
  - MIPv4
    - No new work.
    - Support operations and deployment only.
  - MIPv6
    - Simplify, modularize Mobile IPv6 specification.
    - Attack a few outstanding issues.
    - Address any implementation/deployment issues that might arise.
  - MIPSHOP
    - Quickly finish work on fast handovers and regional mobility management.
    - Publish as Experimental.

Operations and Management Area

Network Configuration

- New working group, response to June 2002 IAB workshop on network management.
- Today: configuration of network devices is very vendor specific.
- Goal: develop an XML based protocol that:
  - Simplifies and standardizes network configuration.
  - Makes network configuration tools interoperable.

IPv6 Operations

- IPv6 is no longer experimental, it is being deployed globally for day to day networking needs.
- Deployment is raising issues involving security and interoperability with IPv4.
- Deployment security issues, particularly with IPv4 interoperability mechanisms, require solutions.
- Ongoing, driven by operator concerns.

Security Area

Revisions to IPSec and IKE

- Perception that IPSec and Internet Key Exchange (IKE) are too complicated and lacking support for key technologies.
- IKEv2 addresses concerns with IKE:
  - NAT/firewall traversal.
  - Support for SCTP.
  - Rekeying.
  - Support for legacy authentication methods.
- Yet to do (probably in IKEv3):
  - Full support for mobility.
    - IPSec identity is tied to IP address.
  - Flexible policy.
    - Policy specification is very firewall like (pass/don’t pass).

Transport Area

Session Initiation Protocol (SIP) and Session Initiation Protocol Investigation (SIPPING)

- RFC 3261 is latest update of SIP.
  - Completed July, 2002.
- Working Group is now dealing with many, many proposals for extensions.
  - Too numerous to mention.
- New proposals for SIP extensions are taken to the SIPPING Working Group where requirements are developed.
  - Proposals can come from IETF or from other standards bodies.
  - Number of proposals for extensions from 3GPP have been published.
- Requirements are taken to the SIP working group for development of the protocol.

Datagram Congestion Control Protocol (DCCP)

- Current UDP/RTP mechanism for real time traffic like Voice over IP has no provision for congestion control.
- DCCP provides Transport Level functionality for unreliable data stream with negotiable congestion control.
- Two current congestion control mechanisms:
  - TCP-like mechanism.
  - TCP Friendly Rate Control (TFRC)

Telephone Number Mapping (ENUM)

- Updated Basic specification is complete and undergoing deployment.
- Further work required to document any administrative or operational procedures.
- Maintain liaison with other groups (such as ITU-T).
- Move ENUM to Draft Standard.

Internet Emergency Preparation (IEPREP)

- Response to 9/11 but extends to all disasters, both natural and man-made.
- Develop requirements for supporting emergency preparedness in the Internet internationally.
- Best Current Practices for operational implementation of services for emergency preparedness using existing Internet protocols.

IP Telephony (IPTEL)

- SIP does not support distribution of call routing information.
- Telephony Routing over IP (TRIP) protocol distributes routing information.
  - In particular, to PSTN gateways.
  - Similar to BGP.
- New protocol or possible extension to TRIP between TRIP server and signaling (SIP) server.
  - Not currently standardized.
  - Proprietary solutions.

Conclusion

- IETF experience:

  Natural to standardize technology that does not differentiate between real time and data traffic.
- IETF was using this approach in the mid 1990's for National Network Infrastructure (NNI) and Global Network Infrastructure (GNI).
- IETF will continue to use that approach now with Next Generation Networks (NGN).
- IETF views NGN as not fundamentally different from the always morphing Internet.