Introduction to the Work of the ASRG and Consent-Based Communications

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Part 1 of 3: About the ASRG.

"What's in a name? That which we call a rose
By any other word would smell as sweet."

***"Romeo and Juliet"* by William Shakespeare**

Part 1 of 3: About the ASRG

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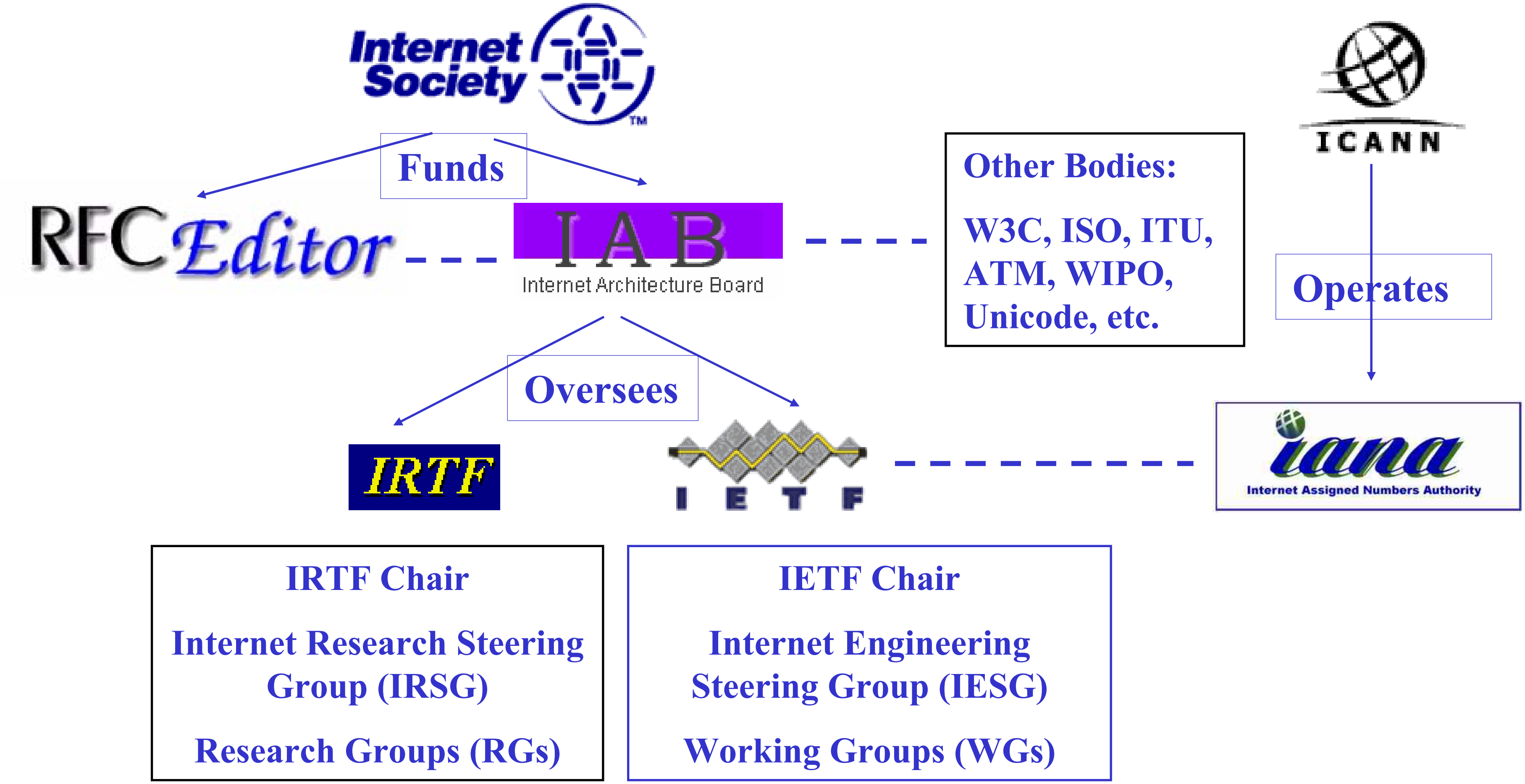
1.1. Internet Standards Bodies and Related Organizations


Internet Society
RFC Editor
IAB
Internet Architecture Board
ICANN
IRTF
I E T F
iana
Internet Assigned Numbers Authority

Funds

Oversees

Operates

Other Bodies:

W3C, ISO, ITU, ATM, WIPO, Unicode, etc.

IRTF Chair

Internet Research Steering Group (IRSG)

Research Groups (RGs)

IETF Chair

Internet Engineering Steering Group (IESG)

Working Groups (WGs)

1.1. Roles of Internet Standards Bodies and Related Organizations

- **Internet Society (ISOC)**
  - Professional membership organization of Internet experts
  - Funds and oversees IAB, IRTF, IETF and RFC Editor
- **Internet Architecture Board (IAB)**
  - A committee of 13 Internet experts chosen by the IETF
  - Provides oversight of Internet architecture, IETF and IRTF
- **The RFC Editor**
  - Edits and publishes Request for Comments (RFC) documents
  - Independent of the IETF and IRTF
- **Internet Assigned Numbers Authority (IANA)**
  - Operated by ICANN on behalf of the IETF
  - Maintains unique parameters for Internet protocols and standards
- **Internet Corporation for Assigned Names and Numbers (ICANN)**
  - Operates the Domain Name System (DNS) under contract with the US Government

1.2. Differences Between IETF and IRTF

- **Internet Engineering Task Force (IETF)**
  - focuses on the ***short-term*** issues of engineering and standards making
  - Operates ***more formally***
  - Consists of 100+ working groups ***working on Internet standards***
- **Internet Research Task Force (IRTF)**
  - focuses on ***long-term*** research issues related to the Internet
  - Operates ***more informally***
  - Consists of 12 research groups ***doing research*** on Internet related issues

1.3. What is the ASRG?

- A *Research* Group (RG) of the IRTF
- An open membership RG, *possible spammer members*
- Formed in March of 2003, founded by Paul Judge
- Membership
  - ***Over 650+*** list ***subscribers*** in addition to website visitors
  - ***Over 6,000+*** mailing list ***messages*** in archive
  - Membership on ***individual basis***, not organizational (RFC 2014)
- Co-Chairs:
  - Dr. Paul Q. Judge
  - Yakov Shafranovich

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1.4. Why was the ASRG Created?

- *Scale, growth, and effect* of spam on the Internet have generated considerable interest in addressing this problem
- Once considered a nuisance, spam has grown to account for a *large percentage of the mail volume* on the Internet.
- This unwanted traffic *stands to affect* local networks, the infrastructure, and the way that people use email.

1.5. Goals of the ASRG

- *Understand* the problem and collectively *propose* and *evaluate* solutions
- *Investigate* the feasibility of *consent-based architecture or framework* to allow individuals and organizations to express consent or lack of consent, and enforce their decisions
- *Will not* pursue research into *legal* issues of spam, other than the extent to which these issues affect, support, or constrain the technology

1.6. ASRG Research Agenda

- **Understanding phase**
- **Proposal Phase**
- **Evaluation Phase**

1.6. ASRG Research Agenda

- **The *understanding phase* includes:**
  - Inventory of problems
  - Analysis and characterization:
    - Analysis of Actual Spam Data
    - Public Trace Data

1.6. ASRG Research Agenda

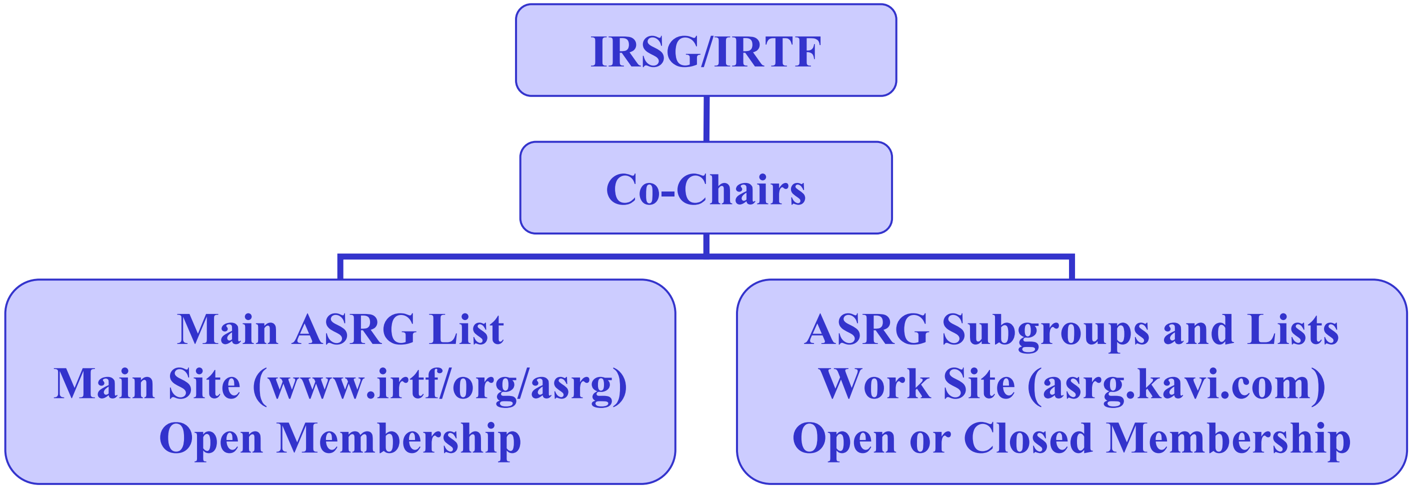
- **The _proposal phase_ includes:**
  - Requirements document
  - Survey of Solutions
    - Taxonomy of solutions
    - Bibliography of spam-related research
    - Consent Framework and related work
  - Identifying standardization requirements
    - Possible later transfer to the IETF
  - Proposals
  - Best Current Practices

1.6. ASRG Research Agenda

- **The *evaluation phase* includes:**
  - Creating an evaluation model
    - Technical Considerations document
    - Requirements document
    - Consent framework
  - Evaluation of Solutions
    - Overall survey
    - Individual proposal by proposal evaluation

1.7. ASRG Organizational Structure.

- Governed by RFC 2014
  - Informal
  - No consensus required
  - Individual not organizational membership



IRSG/IRTF

Co-Chairs

Main ASRG List
Main Site (www.irtf/org/asrg)
Open Membership

ASRG Subgroups and Lists
Work Site (asrg.kavi.com)
Open or Closed Membership

Part 2 of 3:
Consent Based Communications.

“Thou shalt not consent unto him, nor hearken unto him; neither shall thine eye pity him, neither shalt thou spare, neither shalt thou conceal him. But thou shalt surely kill him;”

Deuteronomy 13:8-9 (KJV)

Part 2 of 3:
Consent Based Communications.

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  5. Consent Framework: Goals, Process, Components, and Examples.
  6. Advantages
  7. Disadvantages
  8. Challenges and Future Work
  9. Questions?

2.1. The Many Definitions of Spam

- **Spamhaus:** *"The word "Spam" as applied to Email means Unsolicited Bulk Email ("UBE")"*
  - Unsolicited means that the Recipient has not granted verifiable permission for the message to be sent.
  - Bulk means that the message is sent as part of a larger collection of messages, all having substantively identical content.
- **American Heritage Dictionary:** *"Unsolicited e-mail, often of a commercial nature, sent indiscriminately to multiple mailing lists, individuals, or newsgroups; junk e-mail."*

2.1. The Many Definitions of Spam

□ **Spamhaus and MAPS Technical Definition:**

1. The recipient's personal identity and context are irrelevant because the message is equally applicable to many other potential recipients; (BULK)
2. The recipient has not verifiably granted deliberate, explicit, and still-revocable permission for it to be sent; (UNSOLICITED)
3. The transmission and reception of the message appears to the recipient to give a disproportionate benefit to the sender. (BULK)

2.1. The Many Definitions of Spam

- **Direct Marketing Association (DMA):** *"e-mail that misrepresents an offer or misrepresents the originator--or in some way attempts to confuse or defraud people" (from News.com story)*
- **FTC and CAUCE:** *"Unsolicited Commercial Email"*
- **Others:** *Unsolicited Email or Bulk Email*

2.1. The Many Definitions of Spam

- Unsolicited
- Commercial
- Bulk
- Fraudulent
- Unsolicited + Bulk
- Unsolicited + Commercial
- Unsolicited + Bulk + Commercial
- Other combinations, etc.

2.1. The Many Definitions of Spam.

- Definition varies from "unsolicited commercial email" to "any email the recipient does not want“
- Often there are no technical differences between spam and "acceptable" email
- Format, content and even aggregate traffic patterns may be identical
- "Bulk" is usually very difficult for an individual recipient to prove, but almost always easy to recognize in practice.
- More detailed discussion must, of course, be precise in the definition of "unsolicited“

2.2. ASRG's Definition of Spam.

- We all agree that we disagree
- We want to leave the definition of spam to be defined by each end-user and ISP as they want
- We do not have an official definition and are not seeking for one
- For most working discussions, the term "Unsolicited Bulk Email" is sufficient

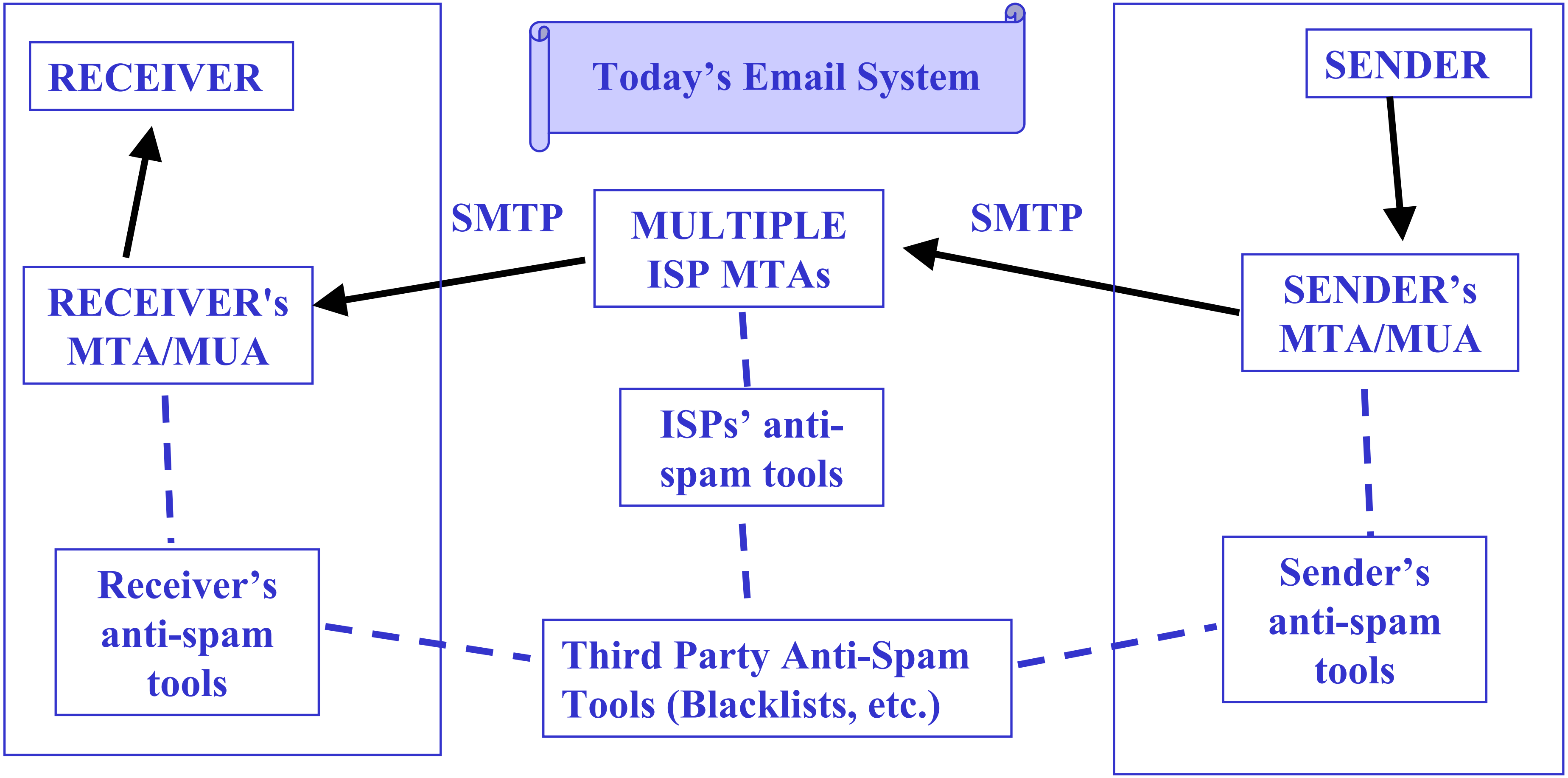
2.3. Why Consent?

- ASRG Charter:
  - *"The definition of spam messages is not clear and is not consistent across different individuals or organizations"*
  - *Therefore, we generalize the problem into "consent-based communication"*
  - *This means that an individual or organization should be able to express consent or lack of consent for certain communication and have the architecture support those desires."*
- Spam may be a permanent part of the Internet like war, taxes, death and cockroaches

2.4. Defining Consent.

- Consent:
  - Expression of wanting to receive specific communications
- Lack of Consent:
  - Expression of not wanting to receive specific communications
- Consent need not necessarily be in advance
- Not the same as the legal concept of Consent
- Computer approximation of person's wishes, does not always correspond exactly to what the person desires
- Exists in a crude form in Instant Messaging systems

2.5. Consent Framework.



2.5. Consent Framework - Goals.

- Provide a system of systems to tie in all anti-spam tools into one cohesive whole
- Leverage existing protocols and email infrastructure
- Allows users and organizations of use their own definitions of spam
- Allows to components to be plugged in as necessary
- Define a set of standard protocols and formats for expressing and denying consent, and for anti-spam tools to communicate
- Allows users to grant and revoke consent, and make the decision known to the sender

2.5. Consent Framework – Process.

- 1. Users and Organizations <u>Define</u> Consent Rules and Policies
  - User's policy may be shared with the ISP or organization
  - ISP's or organization's policy may override the user's policy (possible privacy and anonymity issues)
- 2. MTAs/MUAs <u>Enforce</u> Consent Policies
  - Information from third parties maybe used for enforcement (Blacklists, e-postage, DCC, etc.)
- 3. Some Information May Be <u>Shared</u> with Sender
  - Requests for additional information (C/R, e-postage, etc.)
  - Grant or revocation of consent (opt-in/opt-out)

2.5. Consent Framework – Examples.

- 1. Consent Expression:
  - GUI tools and configuration files to set settings for anti-spam tools
- 2. Enforcement:
  - Filtering tools and anti-spam tools (SpamAssasin, etc.)
  - Third Party Sources:
    - Blacklists and DNSRBLs (Senderbase, MAPS, Spamhaus, SPEWS, etc.)
    - Coordinated detection systems (SpamCop, DCC, Razor, etc.)
    - Marks/Tags (E-postage, Hashcash, TrustedSender, digital certificates, Habeas, etc.)
- 3. Sharing with Sender:
  - Challenge / Response (MailBlocks, etc.)
  - E-Postage requests (TipJar.com, etc.)

2.5. Consent Framework – Components.

- Standard formats and protocols for defining and sharing of consent policies
- Standard protocols and formats for obtaining information from third parties (such as blacklists)
- Standard protocols and formats for consent and revocation of consent, and for sharing consent decisions with the sender
- Best Current Practices
- Extensibility provided in every protocol and format

2.6. Advantages.

- Allows organizations to choose and integrate multiple anti-spam tools easier, providing a united and coordinated response to spam
- Allows each user and organization to define spam as they see fit
- Allows for automatic processing of challenge/response, opt-in and opt-out requests
- Provides a standard format for an opt-in audit trail
- Allows for easier comparison of different anti-spam proposals and solutions
- Edge solution not requiring changes at the network core

2.6. Disadvantages.

- Puts an additional burden on anti-spam tool vendors
- Requires cooperation from anti-spam tools
- Has significant privacy and anonymity issues
- Scalability is unknown
- Effect on spammers unknown
- Deployment issues need to be studied further

2.7. Challenges and Future Work.

□ Investigate the feasibility of consent framework

□ Define consent framework further

□ Define protocols and formats for consent

□ Investigate scalability and deployment issues

□ Analyze possible effect on spammers

Part 3 of 3: Current ASRG Status, Selective Proposals and Activities.

“Hostile armies may face each other for years, striving for the victory which is decided in a single day”

“Art of War”, Sun Tzu

Part 3 of 3: Current ASRG Status, Selective Proposals and Activities.

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  6. Proposals – E-postage.
  7. Challenge / Response Internetworking (CRI).
  8. Best Current Practices.
  9. Questions?

3.1. ASRG Status

- Working on Foundational Documents
- Beginning Analysis of Spam work
- Analyzing some proposals
- Organizing existing anti-spam data
- Working on Consent framework
- Many additional efforts
- More Volunteers Needed!!!

3.2. Foundational Documents.

- Inventory of Problems
  - Lists problems caused by spam and related problems in the current email system
  - Draft being worked on by a subgroup
- Technical Considerations for Spam Control Mechanisms
  - Outlines high-level considerations for anti-spam tools
  - Discusses possible control points in the email infrastructure
  - Written by John Levine, Dave Crocker and Vernon Shryver, all known anti-spam experts, currently in second version
- Requirements for Anti-Spam Proposals
  - Defines common terminology for anti-spam proposals
  - Outlines requirements for anti-spam proposals
  - Draft submitted as an Internet draft

3.3. Analysis and Characterization Subgroup.

- Applies empirical and quantitative methods to problems and issues surrounding spam:
  - Where it comes from
  - What it looks like
  - Ways to eliminate it
- Headed by a professional statistician
- Areas of interest include (but not limited to):
  - Data acquisition and dissemination
  - Research design
  - Measurement & metrics
  - Data analysis and interpretation

3.4. Proposals – DNS-based Authentication Methods.

- RMX/SPF:
  - Seeks to eliminate MAIL FROM forgery
  - Defines a DNS record that needs to be present for every sending SMTP server for each domain used in MAIL FROM
  - Possibly requires a new DNS record type
- DRIP:
  - Seeks to eliminate HELO forgery
  - Defines a DNS record in the domain used in the HELO command containing the IP address of the sending MTA
- Meta Mark:
  - Uses TXT records to marks whether a specific IP address is an MTA or not
- Currently all DNS-based proposals are being combined by a small subgroup into a single proposal
- Significant deployment and anonymity issues need to be analyzed

3.5. Replacing SMTP.

- Several proposals have been submitted to both the IETF and the ASRG
- Seeks to create an alternative email system not backwards compatible with SMTP
- Variations include:
  - Using digital certificates for server-to-server authentication (AMTP)
  - Using DNS records for server-to-server authentication, similar to RMX/SPF/DRIP (MTP)
  - Charging for email – e-postage
  - Digital signatures for every message and a centralized verification system (GIEIS)
  - Pull instead of push approach (IM2000)
  - Alternative “business class” email system with authentication and guaranteed delivery, similar to today’s Express snail mail

3.5. Replacing SMTP – Issues.

- Installed base the size of the Internet is not likely to make such a change anytime soon
- Can take decades to reach that level of adoption, if it ever does.
- Internet comprises a massive number of independent administrations, what is important and feasible to one might be neither to another
- Replacing SMTP with a protocol that allows strangers to send each other mail would not stop spam any more than SMTP-AUTH stopped spam

3.6. Proposals – E-postage.

- Seeks to add cost to existing email systems similar to postal stamps in snail mail
- Various kinds of schemes:
  - Centralized digital money
  - Anonymous digital money (Digicash)
  - Processing power (Hash Cash)
  - Other mechanisms

3.6. E-postage – Issues.

- Lack of an international infrastructure for micro-payments
- Anonymity (Digicash and Hashcash may solve the problem)
- Hijacked Computers and Accounts
- Viruses and worms causing charges to ring up
- Mailing lists suddenly faced with payment choices
- Spammers can steal or buy high performance computers (for Hash Cash)
- Unknown financial, administrative and social costs
- Deployment and scalability issues
- Maybe suitable best for niche applications

3.7. Challenge / Response Internetworking (CRI).

- What is CRI?
  - A protocol for two C/R systems to automatically communicate
  - Saves the trouble of manually clicking on the response
  - Maybe a starting point for a consent token exchange protocol
- Issues with C/R:
  - Adds an authentication layer to SMTP, significant anonymity and deployment issues
  - Problems with disabled people
  - Unknown effect on spammers

3.8. Best Current Practices.

- Defining best practices for:
  - End users
  - Mail administrators
  - Anti-Spam tools vendors
  - Blacklist operators
  - Email senders
  - Consent framework
- Updating existing documents:
  - Existing RFCs 2505, 2635 and 3098

Introduction to the Work of the ASRG and Consent-Based Communications

ASRG Website:

www.irtf.org/asrg

Questions? Comments?

ASRG Mailing List:

asrg@ietf.org