Proposal for DDX Pilot Project:
Using DKIM to Create a Email Trust Channel

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Roadmap

- Trust with domain names
- DKIM authentication basics
- Reputation layer
- A modest DDX proposal

Reputation —IP vs. Domain

IP

- **Pros**
  - Can be at SMTP time
  - Lots of existing practice
  - High granularity
- **Cons**
  - Dynamic
  - Not portable
  - Shared among senders
  - Tied to machine, not org.

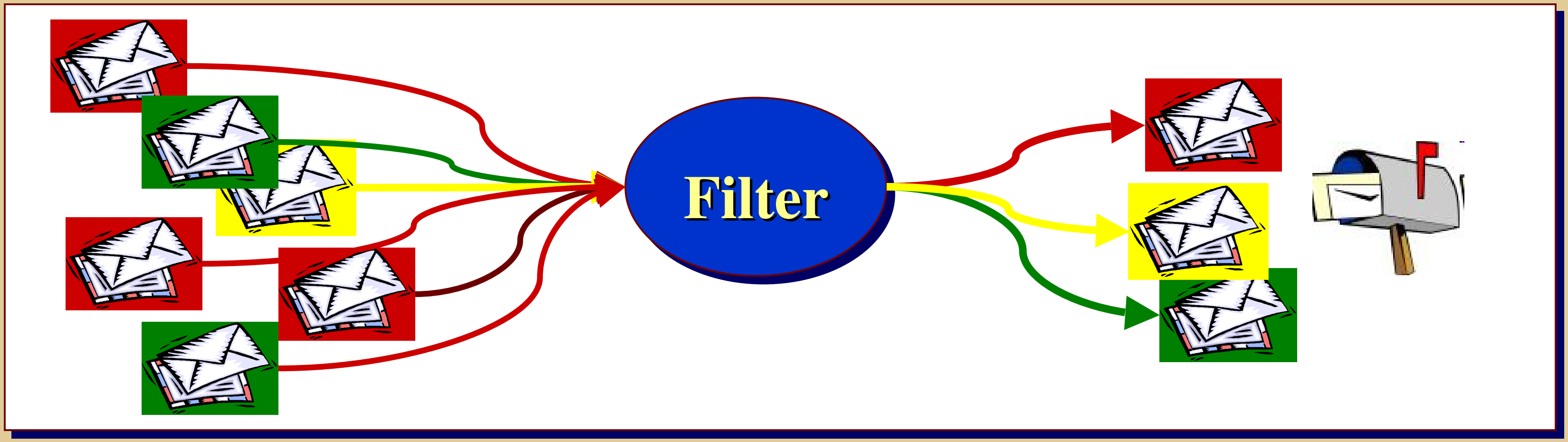
Domain Names

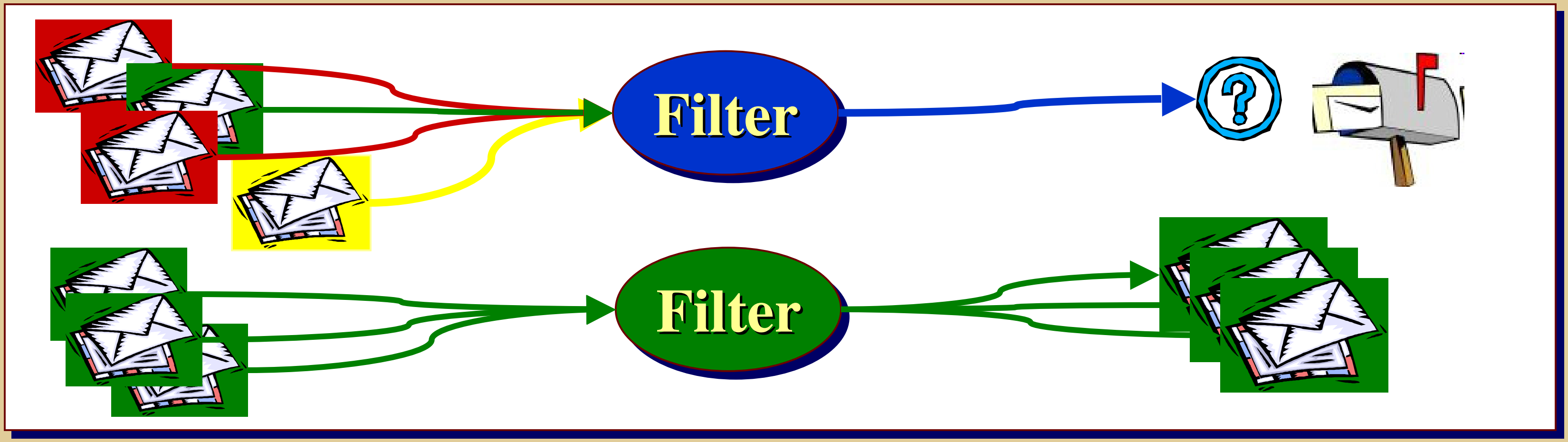
- **Pros**
  - Aligns better with org
  - Long-term stability
  - Less long-term admin
  - Can be delegated
- **Cons**
  - Must wait for message header to be transmitted
  - More complex software

Mistrust and Trust are Different

- **Mistrust**
  - Actor is typically hidden and unaccountable
  - Look for bad behavior
  - Heuristic results – with false positives
- **Trust**
  - Actor is accountable and collaborative
  - Presumes good intent
  - Problems are “errors”, not abuse

Trust is a separate channel





DKIM – *Identify a Responsible Party*

http://dkim.org/specs/draft-ietf-dkim-overview-09.html

Goals

- Compatible/transparent with existing infrastructure
- Minimal new infrastructure
- Implemented independently of MUA clients
- Deployed incrementally
- Permit delegation of signing to third parties (non-authors)

Non-Goals

- No assertions about behaviors of signing identity
- Not directions to receivers
- No protection after signature verification.
- No re-play protection
  - Transit intermediary or a recipient can re-post the message

DKIM Core Technology – *RFC 4871*

- **Authenticated identity**
  - DKIM-specific parameter
  - From:, Sender:, intermediary, mailing list, other…
- **Authentication mechanism**
  - Cryptographic signing
  - Signer chooses header fields to include [+ body]
- **DNS query mechanism**
  - Identity + *selector* defines query string
  - Produces public key

- **Effort to add to origination**
  - Private key
  - Signing module
- **Effort to add to reception**
  - Public key
  - Validation module
- **Limitations**
  - Minimal robustness against mailing lists
  - Relaying can break signature

Sample DKIM Signed Message

```
Received: from mercury.example.net (HELO mercury.example.net) ([192.168.1.1])
    by mail.example.com with ESMTP/TLS/DHE-RSA-AES256-SHA; 01 Oct 2008 17:11:15 +0000
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/simple; d=example.net;
    s=dorrington; t=1222881075; bh=HOVyUZdDUFeesnM3UIaIZgPhdeJQS6N061IKw
    7iUjZ4=; h=Message-ID:Date:From:MIME-Version:To:Subject:
Content-Type:Content-Transfer-Encoding; b=kp3vRZo7CiYpOz8IQtIOTZ+W
    GI+Cd+te3KPLzFVopncaLnmfyNE0XToxOqSo9FZFz7an9B25gxfjZpZ80LpXmaZmtxx
    tikwSp0gdDJOWHUtGD2zs1osjDbRKT6KyNYb7
Message-ID: <48E3AF2E.10108@example.net>
Date: Wed, 01 Oct 2008 10:11:10 -0700
From: Alice Smith <alice@example.net>
MIME-Version: 1.0
To: Bob Brown <bob@example.com>
Subject: Tomorrow's meeting
Content-Type: text/plain; charset=ISO-8859-1
Content-Transfer-Encoding: 7bit
Authentication-Results: mail.example.com; header.From=alice@example.net; dkim=pass (
    sig from example.net/dorrington verified; );
Bob,
```

Status

- dkim.org/#deployment
- **20(!) at interop event**
- **18 software; 5 service**
  - Steady adoption rate
- **Relatively minor early-stage rough edges**
  - Some confusion about identity to evaluate —DKIM has two identity parameters (d= and I=)

- **Further work**
  - ADSP – publish signing practices to detect messages that should be signed
  - Authentication-Results – header from signature validator to identity assessor
  - …

Authentication is Useless…

- ***… by itself***
  - We all say this, but do we appreciate what it really means?
- **We often say: *If you have a validated name, you can make simple decisions for folks you know.***
  - After all, you already know that I'm a great guy…
  - But this means really means you've gone beyond simple authentication… into reputation.
- **This added layer is a barrier to adoption of authentication!**
  - Must have a reputation step, before an adopter gets value.
  - **Potential adopters of authentication are waiting for compelling and immediate utility that is turnkey.**

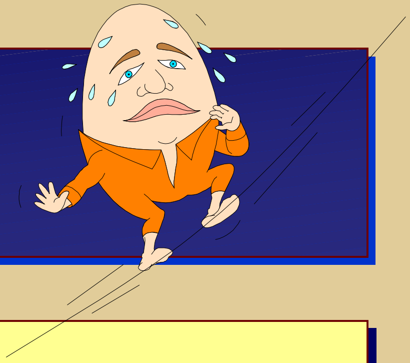
Can a simple project help?

- **Some utility, based on authentication**
  - *Without prior sender/receiver arrangement*
- **Goals**
  - Simple, useful
  - Not compete with “reputation” services…
  - Possibly serve as a template for others
- **Proposal**
  - **Published Member List (PML)**

Published Member List (PML)

- **Pilot project for DDX**
  - Create an email trust domain among member institutions to permit streamlined email filter handling.
  - Demonstrate utility of validated membership lists
- **Publish a list of DDX members**
  - Membership *can be* a meaningful “indication” of Goodness
  - Might publish related attributes, like type of institution
  - Assessor might interpret favorably, but not give message a free pass
- **Could be template for other organizations**
  - Banks, Airlines, Governments, Political Parties…

Project Details



- Write charter for project
- Define expected use by assessment engine
- Agree on list semantics
- Evaluate legal implications
- Document and publish it

- Obtain agreements to publish
- Define DNS/VBR* query format
- Begin operation
- Document the project
- Recruit spamassassin and other users of list

* *VBR: Vouch by Reference <http://www.domain-assurance.org/protocol-overview.phtml>*

Attributes in an Entry

- **Domain name**
- **Associated name of institution**
- **Member attributes, such as**
  - Type of institution
  - …?

Audience Survey

- **Interest?**
  - Idea of membership lists
  - Participation in pilot project
- **Concerns?**