M³AAWG DMARC Training Series

Mike Adkins, Paul Midgen
DMARC.org
October 22, 2012
# M³AAWG DMARC Training Videos

(2.5 hours of training)

This is Segment 1 of 6
The complete series of DMARC training videos is available at: [https://www.m3aawg.org/activities/maawg-training-series-videos](https://www.m3aawg.org/activities/maawg-training-series-videos)

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What is DMARC?
DMARC Segment 1 – about 20 minutes

Mike Adkins, Paul Midgen, DMARC.org
October 22, 2012
Outline

Part 1

- Introduction to DMARC
  - Purpose and Goals
  - History
  - Roadmap

- DMARC Spec Overview
  - Identifier Alignment
  - DMARC Policy Records
  - Reporting

- Short Break

Part 2

- Information for Domain Owners
  - The Reporting and Compliance Process
    - Initial Record Publishing
    - 3rd Party Deployment Profiles
    - Report Processing and Analysis
    - Initial Policy Ramp-up
    - Ongoing Monitoring

- Information for Mailbox Providers
  - DMARC Policy Enforcement
  - Aggregate Reporting
  - Forensic Reporting

M3AAWG 26th General Meeting | Baltimore, October 2012
Things we won’t cover

• Why phishing is a problem.

• How DKIM, SPF, DNS, SMTP, or XML work.

• How to combat abuse of cousin domains or the display name field.

• Phishing website investigation or takedown services.
Who is in the audience?

• Mailbox providers?

• Domain owners?

• Domain owners who use 3rd party senders?

• 3rd party senders (ESPs, hosting providers, etc)?
DMARC = Domain-based Message Authentication, Reporting, and Conformance

• Authentication – Leverage existing technology (DKIM and SPF)

• Reporting – Gain visibility with aggregate and per-failure reports

• Conformance – Standardize identifiers, provide flexible policy actions
Intro to DMARC – Purpose and Goals

• Open version of existing private mechanisms for preventing domain spoofing.

• Standardize use of authenticated identifiers.

• Provide insight into and debugging aids for your authentication practices.

• Incent wider adoption of SPF & DKIM.

• Encourage iteration toward aggressive authentication policy.
Intro to DMARC – Non-Goals

• Address cousin domain abuse
• Address display name abuse
• Provide MUA treatment advice
• An enterprise security solution
• An incident response tool
• Provide delivery reporting
Intro to DMARC - History

- Private Prototype between Paypal and Yahoo – 2007
- Vendors being offering similar functionality – 2009 to present
- First Prototype DMARC records published - Feb '11
- Draft specification released - Jan 30th 2012, revised April ‘12
Intro to DMARC - Roadmap

- Interop Event - July '12
- Produce a final draft
- Submit to the IETF
This has been the first of six DMARC video segments

View the entire

M³AAWG DMARC Training Series

from the public training video pages on the M³AAWG website at:
https://www.m3aawg.org/activities/maawg-training-series-videos

Our thanks to Michael Adkins, Paul Midgen and DMARC.org
for developing the material in this series
and allowing M³AAWG to videotape it for professionals worldwide.

This video is presented by the
Messaging, Malware and Mobile Anti-Abuse Working Group

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www.m3aawg.org
www.facebook.com/maawg
www.twitter.com/maawg
www.youtube.com/maawg

Contact us at:
https://www.m3aawg.org/contact_form
M³AAWG DMARC Training Videos
(2.5 hours of training)

This is Segment 2 of 6
The complete series of DMARC training videos is available at: https://www.m3aawg.org/activities/maawg-training-series-videos

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DMARC Identifier Alignment

DMARC Segment 2 – about 20 minutes

Mike Adkins, DMARC.org and M³AAWG Co-Vice Chairman
October 22, 2012
DMARC Spec Overview

DMARC record lookup

Inbound MTAs
1. Check SPF & DKIM
2. DMARC Identifier Alignment
3. Act on unaligned mail

Aggregate log data

Mail Storage

Aligned Email

Unaligned Email

example.com DNS Server

The Internet

example.com Report Consumer

Forensic reports

Aggregate reports

Aggregate Report Generator
DMARC Spec – Identifier Alignment

• DMARC tests and enforces Identifier Alignment

• Authenticated Identifiers are checked against Mail User Agent (MUA) visible "RFC5322.From" domain

• Only one Authenticated Identifier has to Align for the email to be considered in Alignment
DMARC Spec – Identifier Alignment

• Identifier Alignment can be strict (match exactly) or relaxed:

  • Relaxed SPF: The Organizational Domain of the SPF Authenticated RFC5321:Mail From and RFC5322:From must match.

  • Relaxed DKIM: The Organizational domain from 'd=' value of DKIM authenticated signature and RFC5322.From must match.
Organizational Domain

• TLD + 1 atom
  • groups.facebook.com = facebook.com
  • aol.co.uk = aol.co.uk
  • foo.bar.example.ne.jp = example.ne.jp

• Uses publicsuffix.org for TLD list

• More robust methods being considered
SPF and DKIM Strict Identifier Alignment

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQV0R/1iW+RxSbQiRlaCcwZpXTF/xjWk0xjYI/8S0UUvtFPHZ11 0cy
  +svp5ymrqBgnDEN/ZQEcfnzYEo1BNL/18z1MKpmVOf/9cLIpTvbaWi/G2VBY
  LX0NpLSymtoeqTYOJqoiNlzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

- SPF domain = example.com
- DKIM domain = example.com
- From domain = example.com
SPF Strict Identifier Alignment

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com
From: "Postmaster" <postmaster@example.com>

• SPF domain = example.com
• From domain = example.com
DKIM Strict Identifier Alignment

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
smtp.mail=postmaster@example.com; dkim=pass header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxsBQiRlaCcwZpXTF/xjWk0xjY1/8S0UUtFPHZ1l 0cy+svp5ymrqBgnDEN/ZQEcfnzYEOg1BNL/I8zlMKpVOf/9cLIpTvbaWi/G2VBY

From: "Postmaster" <postmaster@example.com>

• DKIM domain = example.com
• From domain = example.com
SPF and DKIM Strict Unaligned

Return-Path: postmaster@phish.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@phish.com
designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=fail header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=015o8r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiR1aCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZ1l 0cy+svp5ymrqBgnDEN/ZQEcfmzYEo1BNL/I8zlMKpmVOf/9cL1pTVbaWi/G2VBYLX0NPLSymteqTBYOJqoiNLzDNP0lpVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

• SPF domain = phish.com
• From domain = example.com
SPF and DKIM Strict Unaligned

Return-Path: postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@facebookmail.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=015o8r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNNQVoR/1lW+RxSbQiRlACcwZpXTF/xjWk0xjY1/8SOUUvtFPHZ11 0cy
+svp5ymrqBgnDEN/ZQEcfnzYEOg1BNL/I8zlMKpVOf/9cLIPTVbaWi/G2VBY
LX0NpLSymtoeqTBYOOJqoiNLzDNP01pVg ZyUnf 8h90=;
From: "Postmaster" <postmaster@example.com>

• SPF domain = foo.example.com
• DKIM domain = bar.example.com
• From domain = example.com
SPF and DKIM Relaxed Alignment

Return-Path: postmaster@bounce.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@bounce.example.com designates 10.1.1.1 as permitted sender)
smtp.mail=postmaster@bounce.example.com; dkim=pass header.i=@bounce.example.com DKIM-Signature: v=1; a=rsa-sha256; d=bounce.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@bounce.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m32vppP3OLGNQVoR/l1W  +RxSbQiRlaCcwZpXTF/xjWk0xjYi/8S0UUvtFPH21l 0cy+svp5ymrqBgnDEN/ZQEcfmzYE0g1BNL/ I8z1MKpmVOf/9cLIpTVbaWi/G2VBY LXONpLsSymtoeqTBYO0JqoiNLzDNP01pVgYUnf8h90=;
From: "Postmaster" <postmaster@foo.example.com>

- SPF domain = bounce.example.com
- SPF Organizational domain = example.com
- DKIM domain = bounce.example.com
- DKIM Organizational domain = example.com
- From domain = foo.example.com
- From Organizational domain = example.com
SPF Relaxed Alignment

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com
From: "Postmaster" <postmaster@example.com>

- SPF domain = example.com
- SPF Organizational domain = example.com
- From domain = example.com
- From Organizational domain = example.com
DMARC Spec – Alignment Examples

DKIM Relaxed Alignment

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
    smtp.mail=postmaster@example.com; dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
    q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGK/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZ11 0cy+ssvp5ymrqBgnDEN/ZQEcfnzYEOg1BNL/I8z1MKPmVOf/9cLiPiTvbaWi/G2VBYLXONpLsSympoqTBYO0JqoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

• DKIM domain = foo.example.com
• DKIM Organizational domain = example.com
• From domain = example.com
• From Organizational domain = example.com
SPF and DKIM Relaxed Unaligned

Return-Path: postmaster@phish.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@phish.com designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com; dkim=fail header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=; b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZ31 0cy+svp5ymrqBgnDEN/ZQEcfmzYEo1BNL/I8zlMKPmVOf/9cLIpTVbawi/G2VBYLX0NpLsSymtoeqTBYOJqoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

- SPF domain = phish.com
- SPF Organizational domain = phish.com
- From domain = example.com
- From Organizational domain = example.com
Exercise 1
Is SPF in Strict Alignment?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
smtplib.mail=postmaster@example.com; dkim=pass header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
    q=dns/txt; i{@example.com}; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/1lW+RxSbQiRlaCcwZpXtF/xjWk0xjY1/8S0UUtFPHZH1I 0cy
    +svp5ymrqBgnDEN/ZQEcfnzYE0g1BNL/I8z1MKPmVoF/9cLiPtvbaWi/G2VBY
    LXONpLSymtoeqTBYOOJqoiNLzDP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 1
Is SPF in Strict Alignment?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of
postmaster@example.com does not designate 10.1.1.1 as permitted sender)
smtp.mail=postmaster@example.com; dkim=pass header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=; b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlAcwZpXTF/xjWk0xjY1/8S0UUtFPHZ11 0cy+svp5ymrqBgnDEN/ZQEcfnzYEog1BNL/I8zlMKpmVOf/9cLIPvbaWi/G2VBY
From: "Postmaster" <postmaster@example.com>

Answer: No, SPF did not pass.

Is the email Aligned anyway?
Exercise 1
Is SPF in Strict Alignment?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
smtp.mail=postmaster@example.com; dkim=pass header.i=@example.com
DKIM-Signature: v=1; a=rsa-sha256; d=example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=015o8r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUtFPHZ11 0cy+s
svp5ymrqBgnDEN/ZQEcfmzYEOgIBNL/I8z1MKPvOOf/9cLIpTVbaWi/G2VBY
LXONpLSymtoeqTBYOJqoiNLzDNP01pVgZYunf8h90=
From: "Postmaster" <postmaster@example.com>

Answer: No, SPF did not pass.

Is the email Aligned anyway?

Answer: Yes, DKIM is in Strict Alignment, so the email is Aligned regardless.
Exercise 2
Is SPF in Relaxed Alignment?

Return-Path: postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@facebookmail.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtpFPHZ11 0cy+svp5yMrqBgnDEn/ZQEcfmzYEo4g2BNL/18z1MKPmVOF/9cLIpTVbaWi/G2VBY
  LX0NpLsSymtoeqTBYOJqoiNLzDNP0lpVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 2
Is SPF in Relaxed Alignment?

Return-Path:postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@facebookmail.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGvNQVoR/1Iw+RxSbQiRlaCcwZpXtX/jWk0xjY1/8S0UUvtFPHZ11 0cy+svp5ymrqBgnDEN/ZQEcfmzYE0g1BNL/I8z1MKpmVOf/9cLiPtvbaWi/G2VBY
LX0NpLsSymtoeqTBY0OJqoiNLzDNP01pVqZYunf8h90=
From: "Postmaster" <postmaster@example.com>

Answer: Yes, foo.example.com shares the same Organizational domain as example.com.
Exercise 3
Is DKIM in Strict Alignment?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
  smtp.mail=postmaster@example.com; dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
  b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUtFPHZ11 0cy+svp5ymrqBgnDEN/ZQEcfmzYEo1BNL/I8zlMKPmVOf/9cLiTvbaWi/G2VBY
  LXONpLsSyntoeqTBYOJqoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 3
Is DKIM in Strict Alignment?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
smtp.mail=postmaster@example.com; dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZl1 0cy+
svp5ymrqBgnDEN/ZQEcfnzYE0g1BNL/I8z1MKPmVOf/9cLiTvbaWi/G2VBY
LXONpLsSymtoeqTBYOJoqINLzDNP01pVgZYunf8h90=
From: "Postmaster" <postmaster@example.com>

Answer: No, foo.example.com does not exactly match example.com

Under what conditions would the email be Aligned?
Exercise 3
Is DKIM in Strict Alignment?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)

smtp.mail=postmaster@example.com; dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjYI/8S0UUtFPHZ1l 0cy+svp5ymrqBgnDEN/ZQEcfmzYE0g1BNL/I8z1MKpMvOf/9cLiPtvbaWi/G2VBY
LXONpLsSymtoeqTBY0JqoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

Answer: No, foo.example.com does not exactly match example.com

Under what conditions would the email be Aligned?

Answer: Since SPF does not pass, the email would only be Aligned if Relaxed DKIM Alignment was allowed.
Exercise 4
Under what conditions would this email be considering in Alignment?

Return-Path: postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of
    postmaster@example.com does not designate 10.1.1.1 as permitted sender)
    smtp.mail=postmaster@foo.example.com; dkim=fail header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
    q=dns/txt; i=@bar.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:
    Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
    b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZ1l 0cy
    +svp5ymrqBgnDEN/ZQEcfmzYE0g1BNL/I8z1MKPmVOf/9cLIPtvbaWi/G2VBY
    LXO NP LsSymtoeqTBY0OJqoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 4
Under what conditions would this email be considering in Alignment?

Return-Path: postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
    smtp.mail=postmaster@foo.example.com; dkim=fail header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
    q=dns/txt; i=@bar.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
    bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=; b=T6m3ZvppP3OLGNQVoR/llW+RxSbQiRlaCcwZpXTF/xjWk0xjYl/8SOUUvtFPHZ11 0cy+svp5ymrqBgnDEN/ZQEcfmzYEo1BNL/I8zlMKPmVOf/9cLiPjVbaWi/G2VBY LxONpLsSymtoeqTBYOJqoINLzDNp01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

Answer: None. Neither DKIM nor SPF are valid.

Assuming DKIM and SPF were actually valid, under what conditions would this email be considered Aligned?
Exercise 4
Under what conditions would this email be considering in Alignment?

Return-Path:postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender)
  smtp.mail=postmaster@foo.example.com; dkim=fail header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@bar.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
  bh=01508r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
  b=T6m3ZvppP3OLGNQVOR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjYI/8S0UUvtFPHZII 0cy+syp5ymrqBgnDEN/ZQEcfnzYEQgiBNL/I8zlMKPmVoF/9cLiIpTVbaWi/G2VBY
  LXONpLsSymtoeqTBYOJqoiNZDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

Answer: None. Neither DKIM nor SPF are valid.

Assuming DKIM and SPF were actually valid, under what conditions would this email be considered Aligned?

Answer: If Relaxed Alignment was allowed for either DKIM or SPF, the email would be Aligned.
This has been the second of six DMARC video segments

View the entire

M³AAWG DMARC Training Series

from the public training video pages on the M³AAWG website at:

https://www.m3aawg.org/activities/maawg-training-series-videos

Our thanks to Michael Adkins, Paul Midgen and DMARC.org
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and allowing M³AAWG to videotape it for professionals worldwide.

This video is presented by the
Messaging, Malware and Mobile Anti-Abuse Working Group
For information about M³AAWG:
www.m3aawg.org
www.facebook.com/maawg
www.twitter.com/maawg
www.youtube.com/maawg

Contact us at:
https://www.m3aawg.org/contact_form
M^3AAWG DMARC Training Series

Mike Adkins, Paul Midgen
DMARC.org
October 22, 2012
M3AAWG DMARC Training Videos
(2.5 hours of training)

This is Segment 3 of 6
The complete series of DMARC training videos is available at:
https://www.m3aawg.org/activities/maawg-training-series-videos

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DMARC Policy Records
DMARC Segment 3 – about 30 minutes

Mike Adkins, Paul Midgen, DMARC.org
October 22, 2012
DMARC Spec – Policy Records

• TXT records in DNS
  • _dmarc.example.com

• Check for a record at the exact RFC5322.From
  • If no record is found, check for a record at the Organizational domain of the RFC5322.From

• Policy options:
  • “none” – simply monitor and supply feedback
  • “quarantine” – process email with high degree of suspicion
  • “reject” – do not accept email that fails DMARC check
## DMARC Spec – Policy Records

<table>
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<tr>
<th>Tag</th>
<th>Purpose</th>
<th>Example</th>
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</thead>
<tbody>
<tr>
<td>v</td>
<td>Protocol Version</td>
<td>v=DMARC1</td>
</tr>
<tr>
<td>p</td>
<td>Policy for the domain</td>
<td>p=quarantine</td>
</tr>
<tr>
<td>sp</td>
<td>Policy for subdomains</td>
<td>sp=reject</td>
</tr>
<tr>
<td>pct</td>
<td>% of messages subject to policy</td>
<td>pct=20</td>
</tr>
<tr>
<td>adkim</td>
<td>Alignment mode for DKIM</td>
<td>adkim=s</td>
</tr>
<tr>
<td>aspf</td>
<td>Alignment mode for SPF</td>
<td>aspf=r</td>
</tr>
<tr>
<td>rua</td>
<td>Reporting URI for aggregate reports</td>
<td>rua=<a href="mailto:aggrep@example.com">mailto:aggrep@example.com</a></td>
</tr>
<tr>
<td>ruf</td>
<td>Reporting URI of forensic reports</td>
<td>ruf=<a href="mailto:authfail@example.com">mailto:authfail@example.com</a></td>
</tr>
<tr>
<td>rf</td>
<td>Forensic reporting format</td>
<td>rf=afrf</td>
</tr>
<tr>
<td>ri</td>
<td>Aggregate reporting interval</td>
<td>ri=14400</td>
</tr>
</tbody>
</table>
DMARC Spec – Example Policy Records

Everyone’s first DMARC record

v=DMARC1; p=none; rua=mailto:aggregate@example.com;
DMARC Spec – Example Policy Records

Dipping a toe in the pool

v=DMARC1; p=quarantine; pct=10; rua=mailto:agg@ex.com; ruf=mailto:fail@ex.com;
DMARC Spec – Example Policy Records

Very aggressive. 100% reject.

dig -t TXT _dmarc.facebookmail.com

v=DMARC1; p=reject; pct=100;
  rua=mailto:postmaster@facebook.com,mailto:d@rua.agari.com;
  ruf=mailto:d@ruf.agari.com;
Exercise 1
Is this a valid record?

p=none; pct=50; rua=postmaster@example.com;
DMARC Spec – Policy Record Exercises

Exercise 1
Is this a valid record?

```
p=none; pct=50; rua=postmaster@example.com;
```

Answer: No. The v= tag is required.
Exercise 2
What DNS TXT record will be queried for mail from foo.example.com?
DMARC Spec – Policy Record Exercises

Exercise 2
What DNS TXT record will be queried for mail from foo.example.com?

Answer: _dmarc.foo.example.com

If no record is found, what will happen?
Exercise 2
What DNS TXT record will be queried for mail from foo.example.com?

Answer: _dmarc.foo.example.com

If no record is found, what will happen?

Answer: _dmarc.example.com will be queried.
Exercise 3
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com;

Is this email Aligned?

Return-Path:postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@foo.example.com; dkim=pass header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple; q=dns/txt; i=@bar.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=; b=T6m3ZvppP3OLGNQVoR/l1LW+RxSbQiRlaCcwZpXTP/xjWk0xjY1/8S0UUvtFPHZ1l 0cy+syp5yrmqBgrDEN/2QECfmzYEo1BNL/I8z1MKPmVOf/9cLIpTVbaWi/G2VBY LXONpLsSymtoeqTBY60JqoiNlzDNP01pVgZYNuf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 3
Given this record for _dmarc.example.com:

```
v=DMARC1; p=none; rua=postmaster@example.com;
```

Is this email Aligned?

```
Return-Path:postmaster@foo.example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com designates 10.1.1.1 as permitted sender) smtp.mail=postmaster@foo.example.com; dkim=pass header.i=@bar.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=bar.example.com; s=s1024-2011-q2; c=relaxed/simple; q=dns/txt; i=@bar.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKR5yT46DR6CGk/Mk=; b=T6m3ZvppP3OLGNQVoR/llW+RxSbQiRlacCwxZpXTF/xjWk0xjYI/8S0UUvtFPHZ1l 0cy +svp5ymrQBgN0EN/2QEcfrzYEo1BNL/I8z1MKpVOo/9cL1pTVbaWi/G2VBY LXONpLsSymteqTBYOJgoiNlzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
```

Answer: Yes. Alignment is Relaxed by default.
Exercise 4
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; adkim=s; aspf=r;

Is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com; dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
  b=T6m3ZvppP3OLGNQVoR/llW+RxSbQiRlaCcwZpXTF/xjWk0xjYl/8S0UUvtFPHZl1 0cy+ssvp5ymrqBgnDEN/ZQEcfmzYEOg1BNL/I8zlMKPmVOf/9cLIpTVbaWi/G2VBY
  LXONpLsSymtoeqTBY0OJgoiNLzDNP01pVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>
Exercise 4
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; adkim=s; aspf=r;

Is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=01508r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxBbQ7dRlaCcwxzZpXrWhsT/xjWk0xj diagnostics=1024
+svp5ymrqBgnDN/ZEcfmzYEOg1BNL/I8z1MKPmVOf/9cLIpTVbaWi/G2VBY
LXONpLsSymtoeqTBYOOJgolNLzDNP01pVgZYunf8h90=
From: "Postmaster" <postmaster@example.com>

Answer: No. SPF did not pass. DKIM passed, but DKIM Alignment is in strict mode and the DKIM domain does not exactly match the From domain.
Exercise 4
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; adkim=s; aspf=r;

Is this email Aligned?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com
does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZypplP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUtFPHZ11 0cy+
svp5ymrqbgnDEN/ZQEcfmzYEOg1BNL/I8zlMKPmVOf/9cLIpTVbaWi/G2VBY
LXONpLsSymtoeqTBYOOJgoINLzDNP0lpVgZYunf8h90=;
From: "Postmaster" <postmaster@example.com>

Then what will happen to the email?
Exercise 4
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; adkim=s; aspf=r;

Is this email Aligned?

Return-Path: postmaster@example.com
Authentication-Results: mx.mail.com; spf=neutral (mail.com: domain of postmaster@example.com does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=76m3ZvppP3OLGNQVoR/11W+RxBsiQlRacwZpXTF/xjWk0xjY1/8S0UUtFPHZ11 0cy+svp5ymrqBgnDEN/ZQEcIkmzYEOg1BNL/I8z1MKPmV0f/9cILpTVbaWi/G2VBYLXOnpLsSymteqTBYOOJgoINLzDNP01pVgZYUnf8h90=;
From: "Postmaster" <postmaster@example.com>

Then what will happen to the email?

Answer: No policy action will be taken. The results will be included in the requested aggregate report and the message will be processed as normal.
Exercise 5
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; ruf=postmaster@example.com
   adkim=s; aspf=s; sp=reject;

Is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
   q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
   bh=0l5o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11W+RxSbQiRlaCcwZpXTF/xjWk0xjY1/8S0UUvtFPHZ11 0cy
   +svp5ymrqBgnDEN/ZQEcfmzYEOg1BNL/I8zlMKPmVOf/9cLIpTVbaWi/G2VBY
   LXONpLsSymtoeqTBYO0JgoiNLzDNp01pVgZYunf8h90=;
From: "Postmaster" <postmaster@bar.example.com>
Exercise 5
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; ruf=postmaster@example.com
    adkim=s; aspf=s; sp=reject;

Is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
    DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
    q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
    bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
    b=T6m3ZvppP3OLGNQVoR/11w+RxSbQiRlaCcwxZpXTF/xjWk0xjY1/8SOUUvtFPHZ1l 0cy
    +svp5yMrqBgnDEN/ZQEcfmzYEOg1BNL/I8zlMKPmVOf/9cLIpTVbaWi/G2VBY
    LXONpLsSymteqrTBYOJgoiNLzDNP01pVgZYunj8h90=;
    From: "Postmaster" <postmaster@bar.example.com>

Answer: Trick question! It depends on whether or not there is a DMARC record at _dmarc.bar.example.com.
DMARC Spec – Policy Record Exercises

Exercise 5
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; ruf=postmaster@example.com
  adkim=s; aspf=s; sp=reject;

If there is no record at _dmarc.bar.example.com, is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
do not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
b=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNQVoR/11w+RxsBqiRlaCcwZpXTF/xjWk0xjYI/8S0UUvtFPHZI1 0cy
  +svp5yMrqBgnDEN/ZQEcfmzYEOg1BNL/I8z1MKpmVOf/9cLlpTvbaWi/G2vBY
  LXONpLsSymtOeqTBYO0Jg0INLzDP0pVgZyunf8h90=;
From: "Postmaster" postmaster@bar.example.com
DMARC Spec – Policy Record Exercises

Exercise 5
Given this record for _dmarc.example.com:

v=DMARC1; p=none; rua=postmaster@example.com; ruf=postmaster@example.com
  adkim=s; aspf=s; sp=reject;

If there is no record at _dmarc.bar.example.com, is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
do not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
  q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type;
  bh=015o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
  b=T6m3ZvppP3OLGNQVoR/l1W+RxSbQiRlaCcwwZpXTF/xjWk0xjY1/8S0UUvtFPHZ11 0cy
  +svp5ymrqBgnDEN/ZQEcfmzYEoq1BNL/I8zlMKPmVOf/9cLiPvbaWi/G2VBY
  LXONpLsSynteqTBYOJg0iNLzDNp01pVgZYunf8h90=;
From: "Postmaster" postmaster@bar.example.com

Answer: No. Both SPF and DKIM are in Strict Alignment mode and neither exactly match the From domain.
Exercise 5
Given this record for _dmarc.example.com:

\[
v=DMARC1; p=none; rua=postmaster@example.com; ruf=postmaster@example.com
  adkim=s; aspf=s; sp=reject;
\]

If there is no record at _dmarc.bar.example.com, is this email Aligned?

Return-Path:postmaster@example.com
Authentication-Results: mx.mail.com; spf=pass (mail.com: domain of postmaster@example.com
does not designate 10.1.1.1 as permitted sender) smtp.mail=postmaster@example.com;
dkim=pass header.i=@foo.example.com
DKIM-Signature: v=1; a=rsa-sha256; d=foo.example.com; s=s1024-2011-q2; c=relaxed/simple;
q=dns/txt; i=@foo.example.com; t=1337318096; h=From:Subject:Date:To:MIME-Version:Content-Type; bh=0l5o8r4ftEPBr083MbUpe0mIrWKRs5yT46DR6CGk/Mk=;
b=T6m3ZvppP3OLGNOvVor/l1W+RxSbQiRlaCcwwPzXn/xjWk0xjy1/8S0UUvtFPHZl1 0cy+ssvp5ymrqBgnDEN/ZQEcfmzYEOg1BNL/I8z1MKPmVOf/9cLIpTVbaWi/G2VBY
  LXONpLsSymtoeqTBYOJgoiNzDNP01pVgZYunf8h90=;
From: "Postmaster" postmaster@bar.example.com

Then what will happen to the email?
Answer: It will be rejected due to the subdomain policy action sp=reject. The results will be included in the requested aggregate report, and a forensic report will be sent.
This has been the third of six DMARC video segments

View the entire

M³AAWG DMARC Training Series

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M³AAWG DMARC Training Series

Mike Adkins, Paul Midgen
DMARC.org
October 22, 2012
# M³AAWG DMARC Training Videos

(2.5 hours of training)

This is Segment 4 of 6

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DMARC Reporting
DMARC Segment 4 – about 15 minutes

Paul Midgen, DMARC.org
October 22, 2012
DMARC Spec – Reporting

Aggregate Reports

- Each report covers one RFC5322.From domain.
- You should get one from each supporting mailbox provider that sees email with your From domain.
- Daily by default, adjustable with ri= tag.
  Hourly: ri=3600

XML Format

- Organized by sending IP address
- Contains
  - Authentication Results (DKIM, SPF)
  - Alignment Results
  - Policy actions taken
  - Reasons for not taking policy actions

Just publish a record to see one
XML Format

The policy they found.
<policy_published>
  <domain>facebookmail.com</domain>
  <adkim>r</adkim>
  <aspf>r</aspf>
  <p>reject</p>
  <sp>none</sp>
  <pct>100</pct>
</policy_published>
XML Format
An example record.
<record>
  <row>
    <source_ip>106.10.148.108</source_ip>
    <count>1</count>
    <policy_evaluated>
      <disposition>none</disposition>
      <dkim>pass</dkim>
      <spf>fail</spf>
    </policy_evaluated>
  </row>
  <identifiers>
    <header_from>facebookmail.com</header_from>
  </identifiers>
  <auth_results>
    <dkim>
      <domain>facebookmail.com</domain>
      <result>pass</result>
    </dkim>
    <spf>
      <domain>NULL</domain>
      <result>none</result>
    </spf>
  </auth_results>
</record>
DMARC Spec – Reporting

Forensic Reports

• One per DMARC failure

• AFRF or IODEF formats

• Should include ‘call-to-action’ URIs

• Throttling

• Privacy issues
  • Might be redacted
  • Might not be supported
DMARC Spec – Reporting

DMARC URLs

Advertise the maximum report size a destination URI will accept

mailto:aggregate@example.com!25M

Works for both report types.
DMARC Spec – Reporting

Verifying 3rd party report destinations

If the record for example.com contains reporting URIs at other domains:

\[
\text{mailto:aggregate@foo.com}
\]

Report generators should verify that foo.com expects the reports by looking for:

\[
\text{example.com._report._dmarc.foo.com}
\]

The 3rd party can change the URI to a different address in their domain:

\[
v=DMARC1; \text{ rua=mailto:reports@foo.com}
\]
This has been the fourth of six DMARC video segments

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M³AAWG DMARC Training Series

Mike Adkins, Paul Midgen
DMARC.org
October 22, 2012
### M³AAWG DMARC Training Videos
(2.5 hours of training)

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DMARC Information for Mailbox Providers
DMARC Segment 5 – about 20 minutes

Paul Midgen, DMARC.org
October 22, 2012
Are you ready for DMARC?

- Do you need DMARC?
  - Understand what DMARC does for the messaging ecosystem.
  - Who are you receiving mail from?

- Review your SPF and DKIM practices.
  - Why validate both?

- Develop a local-policy strategy.
  - Special cases
  - Trusted domains

- Commit to Reporting

- Outbound?
Policy Enforcement in Review

• Evaluate SPF & DKIM according to the RFC.
  • Bonus points: use Authentication-Results

• Select applicable authentication results using alignment.
  • This only determines whether the results are used.

• No aligned and passing results? DMARC validation has failed – time to enforce!
  • None: message disposition is unchanged; “report only”
  • Quarantine: don’t deliver to the inbox.
  • Reject: don’t deliver at all.
Information for Mailbox Providers

Reporting in Review

Aggregate Reporting
• XML data correlating IPs, domains, and authentication results.

• Requires ability to aggregate & store data extracted from inbound messages. This can require a lot of storage.

• Specification is currently least-documented part of DMARC, join dmarc-discuss and ask questions.

Failure Reporting
• Copies of messages failing DMARC validation sent to the sender or their agent.

• Don’t queue. Sending as close to receipt as possible maximizes value.
Operational Considerations

• DMARC policy is the sender’s policy and should have higher priority than local and other policy.

• Consider ways to mitigate the impact of MLMs, forwarders, and so on.
  • These waters are deep. Fish with large teeth. Be deliberate, researched, and iterative.
Information for Mailbox Providers

Reporting and Privacy

Forensic reports can send an unaltered message to someone other than the intended recipient. It may not be from a bad actor.

- Do a privacy review!
- Understand applicable privacy regimes before sending reports.
  - Corporate
  - Federal/Legal
  - Only one US-based MBP is sending failure reports
Resources

Dmarc.org

Resources page for tools
Participate page for list sign up
This has been the fifth of six DMARC video segments

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M³AAWG DMARC Training Series

Mike Adkins, Paul Midgen
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October 22, 2012
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M3AAWG 26th General Meeting | Baltimore, October 2012
DMARC Information for Domain Owners and 3rd Parties
DMARC Segment 6 – about 40 minutes

Michael Adkins, DMARC.org and M³AAWG Co-Vice Chairman
October 22, 2012
Information for Domain Owners

• The Reporting and Compliance Process
  • Initial Record Publishing
  • 3rd Party Deployment Profiles
  • Report Processing and Analysis
  • Rolling out Policies
  • Long Term Monitoring
The Reporting and Compliance Process
For Domain Owners

Phase 1: Initial Auditing

- Publish Initial Record
- Process Reports
- Fix Infrastructure Issues

Phase 2: Initial Policy Ramp-up

- Process Reports
- Make Policy Changes

Phase 3: Ongoing Monitoring

- Assess Initial Threat Level
  - No Abuse Detected
  - Abuse Detected
- Process Reports
- Fix Infrastructure Issues
- Make Policy Changes / Other Response
- Assess Current Threat Level
Initial Record Publishing

Everyone’s first DMARC record

v=DMARC1; p=none; rua=mailto:aggregate@example.com;
**3rd Party Deployment Profiles**

- **Controlled** – The Domain Owner fully controls their own DNS, and wants as much control over their email as possible.

- **Authorized** – The Domain Owner lets the 3rd party dictate the content of some DNS records, while still retaining some operational control.

- **Delegated** – The Domain Owner delegates control of their DNS to the 3rd party, and wants to be mostly hands-off with their email.

- **Hosted** – The Domain Owner allows the 3rd party to handle everything, and has little control.
3rd Party Deployment Profiles

Controlled

The Domain Owner retains control of the domain or subdomain, provides a DKIM signing key to 3rd party and publishes the public key, and includes the appropriate information in their SPF record.

Pro
• This scenario allows 3rd parties to send as the organizational domain if desired.
• The Domain Owner retains operational control.

Cons
• Coordination between the domain owner and the 3rd party mailer is required to ensure proper DKIM key rotation, accurate SPF records, etc.
• Risk of coordination overhead/issues increases as the number of bilateral relationships increase for domain owners and vendors.
3rd Party Deployment Profiles

Controlled

Contractual points

- Process for DKIM key rotation. Obligations of each party, including testing.
- SPF record requirements and process for adding new hosts.
**3rd Party Deployment Profiles**

**Authorized**

Similar to Controlled Profile, except the 3rd party creates the DKIM key pair and generally takes a more active role in dictating record content. This approach is useful for Domain Owners where a different 3rd party is providing DNS and other services for the domain.

**Pros**
- Can streamline provisioning for the 3rd party.
- One less task for the Domain Owner.

**Cons**
- Can create additional management issues for Domain Owners who use multiple 3rd parties.
- Possible additional contractual point for key strength requirements.
3rd Party Deployment Profiles

Delegated

The Domain Owner delegates a subdomain to 3rd party mailer and relies on contractual relationship to ensure appropriate SPF records, DKIM signing, and DMARC records.

Pros

• Reduces Domain Owner implementation issues to mostly contractual.
• The 3rd party is responsible for SPF records, DKIM signing and publishing, etc.
• Domain owner may still be responsible for ensuring Identifier Alignment.

Con

• The Domain Owner potentially gives up day to day control and visibility into operations and conformance.
3rd Party Deployment Profiles

Delegated

Contractual points
• Creation and maintenance of SPF, DKIM and DMARC records
• (Quarterly) Rotation of DKIM keys and minimum length of key (1024 recommended)
• Investigation of DMARC rejections
• Handling of DMARC Reports
• Requirements for reporting back to the Domain Owner
• Indemnification (if any) for mail lost due to improper records or signatures.
3rd Party Deployment Profiles

Hosted

The 3rd party is also providing DNS, webhosting, etc for the Domain Owner and makes the process mostly transparent to the domain owner.

Pro
• Very easy for less sophisticated Domain Owners.
• Can be mostly automated by the 3rd party.

Con
• The domain owner is significantly more dependent on the 3rd party.
### 3rd Party Deployment Profiles

#### 3rd Party responsibilities

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<th>Hosted</th>
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<tbody>
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<td>Provide SPF record content</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Maintain SPF records</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Maintain DKIM records</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Create DKIM Keys</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Rotate DKIM Keys</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Maintain DMARC Records</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Process DMARC reports</td>
<td>N</td>
<td>?</td>
<td>?</td>
<td>Y</td>
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Report Processing and Analysis

Phase 1: Initial Auditing

- Publish Initial Record
- Process Reports
- Fix Infrastructure Issues

Assess Initial Threat Level

Phase 2: Initial Policy Ramp-up

- Process Reports
- Make Policy Changes

Phase 3: Ongoing Monitoring

- Process Reports
- Make Policy Changes/Other Response
- Fix Infrastructure Issues

Abuse Detected

No Abuse Detected

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Report Processing and Analysis

Report Parsing Tools

http://dmarc.org/resources.html

If you develop report parsing tools you are willing to share, please send a note to the dmarc-discuss list and let us know.
Report Processing and Analysis

Step 1: Categorize the IPs in the Aggregate Report

- Your Infrastructure
- Authorized 3rd Parties
- Unauthorized 3rd Parties *

* - You should consider everything an Unauthorized 3rd Party by default.
Report Processing and Analysis – Infrastructure Auditing

Step 2: Infrastructure Auditing

For both your Infrastructure and Authorized 3rd Parties

• Identify owners
• LOE for Deploying Domain Authentication
• LOE for Identifier Alignment
• Business case / Justification
Report Processing and Analysis

Step 3: Identify Malicious Email

Research Unauthorized 3rd Parties and label the Abusers

- Use public data sources
- Vendor services
- Look for known failure cases
- Forensic reports
Report Processing and Analysis

Step 4: Perform Threat Assessment

Categories

- Your Infrastructure
- Authorized 3rd parties
- Unauthorized 3rd parties
- Abusers

Calculate the Sum of Unaligned Email from each Category
Step 4: Perform Threat Assessment

**Phish** = Unaligned Email From Abusers

**Definite False Positives** = Unaligned Email from Your Infrastructure + Unaligned Email from Authorized 3rd parties

**Potential False Positives** = Unaligned Email from Unauthorized 3rd parties

**Consider:**
- Phish vs. False Positives
- Phish vs. Total Aligned Email

If there is no Phish, you don’t have a Domain Spoofing problem and don’t need to move forward with DMARC policies.
Initial Policy Ramp-up

**Phase 1: Initial Auditing**
- Publish Initial Record
- Process Reports
- Fix Infrastructure Issues

**Phase 2: Initial Policy Ramp-up**
- Assess Initial Threat Level
  - Abuse Detected
    - Process Reports
    - Make Policy Changes
    - Fix Infrastructure Issues
  - No Abuse Detected
    - Process Reports
    - Make Policy Changes / Other Response

**Phase 3: Ongoing Monitoring**
- Assess Current Threat Level
- Fix Infrastructure Issues
Initial Policy Ramp-up

Step 1: Verify Authentication and Alignment for all of your Infrastructure and all Authorized 3rd Parties.

Step 2: Update your record to:

\[ p=\text{quarantine}; \; \text{pct}=10; \]

Do not:
- Skip ‘quarantine’ and go straight to ‘reject’
- Change the policy action from ‘none’ without setting a ‘pct’
Initial Policy Ramp-up

Step 3: Monitor your reports for issues and address them.

Make a ‘go forward / go back’ decision.

Step 4: Update your record to increase the ‘pct’.

Rinse and repeat until you get to ‘pct=100’.
Initial Policy Ramp-up

Step 5: If needed, update your record to:

\[ p = \text{reject} \]
Ongoing Monitoring

Phase 1: Initial Auditing
- Publish Initial Record
- Process Reports
- Fix Infrastructure Issues

Phase 2: Initial Policy Ramp-up
- Abuse Detected
- Process Reports
- Make Policy Changes
- Fix Infrastructure Issues

Phase 3: Ongoing Monitoring
- No Abuse Detected
- Process Reports
- Assess Current Threat Level
- Make Policy Changes / Other Response

Abuse Detected
- Assess Initial Threat Level
- Fix Infrastructure Issues
- Make Policy Changes
- Other Response
Ongoing Monitoring

• Categorize new IPs in Aggregate reports
  • Your Infrastructure
  • Authorized 3rd Parties
  • Unauthorized 3rd Parties
  • Abusers

• Reassess the Threat Level
  • Increases in phish
  • Changes in unaligned email volume
  • Make changes accordingly
  • Takedowns or other phish responses
Ongoing Monitoring

Be on the look out for:
• Infrastructure changes
• New products / new subdomains
• New authorized 3rd parties
• Mergers and acquisitions
Resources

Dmarc.org

Resources page for tools
Participate page for list sign up
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