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A NULL MX Resource Record for Domains that Accept No Mail
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Abstract

Internet mail determines the address of a receiving server through the DNS, first by looking for an MX record and then by looking for an A/AAAA record as a fallback. Unfortunately this means that the A/AAAA record is taken to be mail server address even when that address does not accept mail. The NULL MX RR formalizes the existing mechanism by which a domain announces that it accepts no mail, which permits significant operational efficiencies.

Status of This Memo

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[1.](#) Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [\[RFC2119\]](#).

[2.](#) Introduction

This document formally defines the "NULL MX" as a simple mechanism by which a domain can indicate that it does not accept email.

SMTP clients have a prescribed sequence for identifying a server that accepts email for a domain. [Section 5 of \[RFC5321\]](#) covers this in detail, but in essence the SMTP client first looks up a DNS MX RR and if that is not found it falls back to looking up a DNS A or AAAA RR. Hence this overloads an email service semantic onto a DNS record with a different primary mission.

If a domain has no MX records, senders will attempt to deliver mail to the hosts at the domain's A or AAAA record's addresses. However many domains do not accept email.

If there is no SMTP listener at the A/AAAA address, message delivery will be attempted repeatedly for a long period, typically a week,

before the sending MTA gives up. This will delay notification to the sender in the case of misdirected mail, and will consume resources at the sender.

This document defines a NULL MX that will cause all mail delivery attempts to a domain to fail immediately, without requiring domains to create SMTP listeners dedicated to preventing delivery attempts.

3. The NULL MX Resource Record

To indicate that a domain does not accept email, it advertises a single MX RR (see [\[RFC1035\]](#), [section 3.3.9](#)) with an RDATA section consisting of preference number 0, and a dot, i.e., the DNS root, as the exchange domain, to denote that there exists no mail exchanger for a domain. (The DNS root is not a valid host name, which avoids any possibility that a NULL MX record could be confused with an ordinary MX record.)

A domain MUST NOT advertise multiple MX RRs including a NULL MX.

4. Effects of NULL MX

The NULL MX record has a variety of efficiency and usability benefits.

4.1. SMTP Server Benefits

The ability to detect domains that do not accept email offers many resource savings to an SMTP client. It will discover on the first sending attempt that an address is not deliverable, avoiding queuing and retries.

A receiving SMTP server that chooses to reject email during the SMTP conversation that presents an undeliverable [RFC5321](#).MailFrom or [RFC5322](#).From domain (see [\[RFC5598\]](#) for the definitions of these terms) can be more confident that an attempt to send a Delivery Status Notification or other response will reach a recipient SMTP server.

4.2. Dealing with undeliverable and abusive mail

Mail often has an incorrect address due to user error, where the address was mistranscribed or misunderstood, for example, to `alice@www.example.com` or `alice@example.org` or `alice@example.com` rather than `alice@example.com`. NULL MX allows a mail system to report the delivery failure when the user sends the message, rather than hours or days later.

Senders of abusive mail often use forged undeliverable return addresses. NULL MX allows DSNs and other attempted responses to such mail to be disposed of efficiently.

4.3. Domains that Do Not Send Mail

The operator of an SMTP server might prefer to reject mail with a [RFC5321](#).MailFrom or [RFC5322](#).From domain that publishes NULL MX, since a non-delivery notice or response will not be accepted, and legitimate mail rarely comes from domains that do not accept replies.

SMTP servers that reject mail because a MAIL FROM domain has a NULL MX record SHOULD use a 550 reply code and a 5.1.2 enhanced status code [[RFC3463](#)].

A domain that does not accept mail, as declared by NULL MX, often will also not send mail. Operators can publish SPF [[RFC7208](#)] -all policies to make an explicit declaration that the domain is not valid in the [RFC5321](#).MailFrom command.

5. Security Considerations

SMTP mail is inherently insecure since it does not validate any of the e-mail addresses in the message or envelope. This specification is about eliminating one small section of SMTP insecurity.

In the unlikely event that a domain legitimately sends email but does not want to receive email, SMTP servers that reject mail from domains that advertise a NULL MX risk losing email from those domains. The normal way to send mail for which a sender wants no responses remains unchanged, by using an empty [RFC5321](#).MailFrom address.

Within the DNS, a NULL MX RR is an ordinary MX record and presents no new security issues. If desired, it can be secured in the same manner as any other DNS record using DNSSEC.

6. References

6.1. Normative References

- [RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](#), November 1987.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC3463] Vaudreuil, G., "Enhanced Mail System Status Codes", [RFC 3463](#), January 2003.

[RFC5321] Klensin, J., "Simple Mail Transfer Protocol", [RFC 5321](#), October 2008.

[6.2.](#) Informative References

[RFC5598] Crocker, D., "Internet Mail Architecture", [RFC 5598](#), July 2009.

[RFC7208] Kitterman, S., "Sender Policy Framework (SPF) for Authorizing Use of Domains in Email, Version 1", [RFC 7208](#), April 2014.

[Appendix A.](#) Change Log

NOTE TO RFC EDITOR: This section may be removed upon publication of this document as an RFC.

[A.1.](#) Change to appsawg-nullmx-04

Reorganize.

[A.2.](#) Change to appsawg-nullmx-03

Editorial nits per Murray.

[A.3.](#) Change to appsawg-nullmx-02

Should not publish NULL MX with other MX.

Never say never.

Add 5.1.2 enhanced status code.

Minor editorial changes.

[A.4.](#) Change to appsawg-nullmx-1

Editorial improvements per D. Crocker's review.

[A.5.](#) Change to appsawg-nullmx-0

Fix typos.

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