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

When the 5321.MailFrom domain in an e-mail message has a DNS MX Resource Record (RR), it is making an explicit statement that it is willing to accept email. However, when the domain has just a DNS A or AAAA RR, there mail clients cannot easily tell whether the domain accepts mail, as many hosts on the Internet advertise an A or AAAA RR regardless of whether they want to accept email.

The NULL MX RR formalizes the existing mechanism by which a domain announces that it accepts no mail.

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## [1.](#) Introduction

This document formally defines the "NULL MX" as a simple mechanism by which a domain can indicate that it will never accept email.

SMTP clients have a prescribed sequence for resolving how to deliver email to 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.

Many domains do not accept email, but do have A or AAAA records. If they have no MX records, senders will attempt to deliver mail to those A or AAAA records.

If there is no SMTP listener at that address, the message 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.

If the domain has an SMTP listener at that address that rejects all connections (for instance with a 554 response as a connection-opening response) or has MX records pointing to such a listener then the sender will be notified in a timely fashion, but resources (generating a bounce) will still be consumed by the sender and it requires additional services to be provided which provide little benefit to the domain.

These resource usage problems are exacerbated when large volumes of email are sent using forged email addresses in a domain which does not accept email as its envelope sender, causing large numbers of



bounces to be generated and to consume large amounts of resources at the sender of the bounces.

This document defines a NULL MX that will cause all mail delivery attempts to a domain to fail immediately, without any reconfiguration of existing MTAs.

## **2. SMTP server benefits**

Being able to detect domains that never accept email offers many resource savings to an SMTP server. In the first instance, it can choose to reject email during the SMTP conversation that does not present a deliverable 5321.MailFrom domain.

In the second instance, if an SMTP server accepts an email, it can be confident that an attempt to send a non-delivery email will likely be answered by another SMTP server. This greatly helps to reduce non-delivery queues. This contrasts greatly with the current situation where a non-delivery email for, e.g., `www.example.net`, will sit in the queue for a full queue lifetime as SMTP connection attempts to `www.example.net` simply time out.

## **3. Parallel Considerations**

Clearly the perpetrators of abusive mail can adapt such that the "vast class of email" that this mechanism helps identify, simply move over to using 5321.MailFrom domains that have valid MX RRs.

While this is true, the direct benefits to the SMTP server still apply. When an SMTP server queues a non-delivery email, the target domain will accept the email or give a definitive rejection so the queue entry will be removed promptly, thus keeping the queues short.

There is also a fair amount of mail that is just misaddressed by people who mistranscribed or misunderstood an e-mail address, for example, `alice@www.example.com` or `alice@examp1e.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.

## **4. The NULL MX Resource Record**

To indicate that a domain never accepts email, it advertises a single MX RR with a RDATA section consisting of preference number 0, and a dot, i.e., the DNS root, as the mail exchanger 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.)



The interpretation of a NULL MX RR only applies when the domain has a single MX RR. If a domain advertises multiple MX RRs including a NULL MX, the interpretation is as described in [RFC5321](#).

## **5. The 'I never send email' Corollary**

An SMTP server when presented with an "I never accept email" MX might decline to accept such email as it knows that a non-delivery will never be accepted, and that 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.

## **6. Security Considerations**

SMTP mail is inherently insecure in that it is feasible for even fairly casual users to negotiate directly with SMTP servers. This proposal is about eliminating one small section of SMTP insecurity.

In the unlikely event that a domain legitimately sends email but never wants to receive email, SMTP servers that reject mail from domains that advertise a NULL MX risk losing email from those domains. Note that the normal way to send mail for which a sender wants no responses remains unchanged, by using an empty 5321.MailFrom address.

Within the DNS, a NULL MX RR is an ordinary MX record and presents no new security issues.

## **7. Normative References**

- [RFC1034] Mockapetris, P., "Domain names - concepts and facilities", STD 13, [RFC 1034](#), November 1987.
- [RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](#), November 1987.
- [RFC5321] Klensin, J., "Simple Mail Transfer Protocol", [RFC 5321](#), October 2008.

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