# Introduction to Mailmunge
## 2024-03-07
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# Outline

- What is Mailmunge?

- Mailmunge architecture

- Mailmunge and Perl

- Brief overview of SMTP

- How Mailmunge fits into SMTP

- Sample filters

- Linux-Ottawa filter

- Questions and Answers

# What is Mailmunge?

- Mailmunge is a Perl framework for writing email filters
    - Uses the MIME::tools module for handling MIME
    - Includes base classes and utility functions for writing filter
- Postfix and Sendmail support the **Milter** email filtering API
- Milter is written in C and is multi-threaded
- A couple of C helper programs bridge the gap between multi-threaded C and your single-threaded Perl filter
- *Much* easier to write your filters safely in Perl than in C

# Mailmunge Architecture
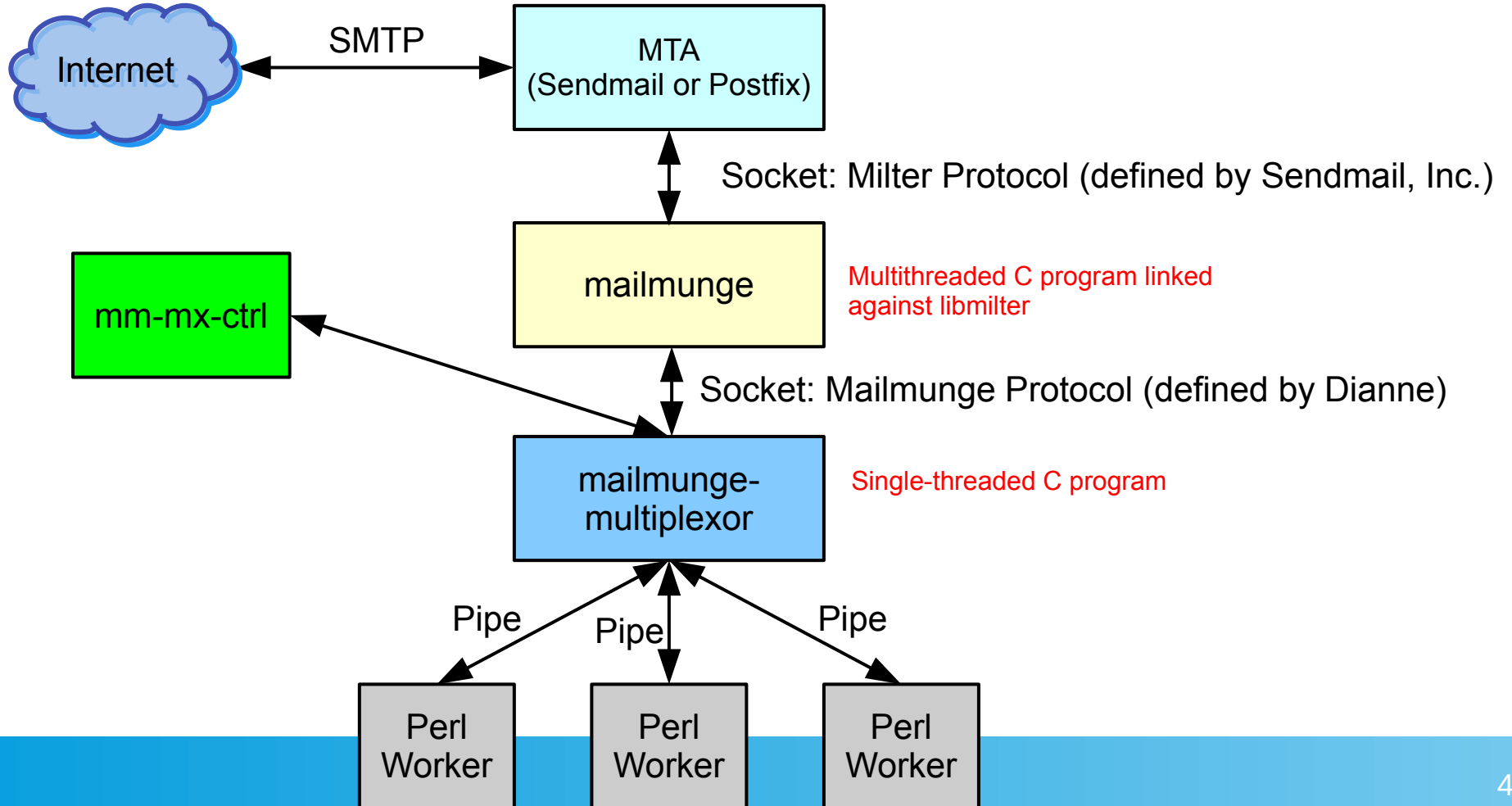
# Mailmunge and Perl

- The multiplexor manages a pool of Perl processes

- The Perl processes communicate with the multiplexor over their STDIN and STDOUT file descriptors (and possibly others)

- The protocol between the multiplexor and the Perl process is documented, but you don't need to know about it...

- ... the Mailmunge::XXX Perl packages handle the communication details for you, letting you concentrate on your filtering logic.

- In principle, you could write your filter in your programming language of choice as long as you obey the communication protocol.  In practice, everyone uses Perl.

# SMTP

- SMTP (Simple Mail Transfer Protocol) is the very ancient protocol still used to deliver email across the Internet

- If you want to send email to `user@example.org`, then:

  - SMTP client finds who is responsible for accepting mail for `example.org` by looking up *MX records* in the DNS

  - Client connects to the best MX host and initiates a TCP connection on port 25

  - Client and server speak SMTP to exchange mail

# SMTP continued

- An SMTP conversation consists of commands sent by client and responses returned by server

- Responses begin with a 3-digit number:
  - 2xx - Command succeeded; everything's cool
  - 3xx - Provisional success; keep going
  - 4xx - Temporary failure; command might succeed if retried in future
  - 5xx - Permanent failure; command is unlikely to ever succeed

- Modern servers support Extended SMTP (ESMTP) with additional capabilities including TLS encryption; these are not important for this discussion and I will use traditional SMTP

# Sample SMTP conversation

**C:** Connect on port 25 to server

**S: 220 server.example.org ESMTP**

**C: HELO client.example.org**

**S: 250 server.example.org**

**C: MAIL FROM:<user1@example.org>**

**S: 250 2.1.0 Ok**

**C: RCPT TO:<user2@example.org>**

**S: 250 2.1.5 Ok**

**C: DATA**

**S: 354 End data with <CR><LF>.<CR><LF>**

**C:** Sends email delimited with a dot on a line by itself

**S: 250 2.0.0 Ok: queued as 4TlLCL6mPnzgd52W**

**C: QUIT**

**S: 221 2.0.0 Bye**

**s:** Closes connection

# SMTP conversation with Mailmunge

C: *Connects on port 25 to server*

filter_relay

S: `220 server.example.org ESMTP`

C: `HELO client.example.org`

filter_helo

S: `250 server.example.org`

C: `MAIL FROM:<user1@example.org>`

filter_sender

S: `250 2.1.0 Ok`

C: `RCPT TO:<user2@example.org>`

filter_recipient

S: `250 2.1.5 Ok`

C: `DATA`

S: `354 End data with <CR><LF>.<CR><LF>`

C: *Sends email delimited with a dot on a line by itself*

filter_message

S: `250 2.0.0 Ok: queued as 4TlLCL6mPnzgd52W`

C: `QUIT`

S: `221 2.0.0 Bye`

S: *Closes connection*

# Demo of Sample Filters

- Demo secret-bob-filter, content-filter and OCLUG filter

# Resources

- **Mailmunge:  https://www.mailmunge.org/**

- Milter library API documentation: https://www.ibm.com/docs/en/aix/7.3?topic=management-sendmail-mail-filter-api

- Postfix and Milter: https://www.postfix.org/MILTER_README.html

- Sendmail and Milter: https://www.sendmail.org/~ca/email/doc8.11/op.pdf (this is the latest I could find; Sendmail ships with newer versions)

# Q&A

- Questions?  Answers.