

Makefile with Email Notification

How to submit jobs and get notified when jobs fail.

1. Motivation

Submitting jobs often needs more than running scripts in tmux.

Jobs may fail silently or run for a long time, and the user cannot keep polling their status.

2. Makefile

```
RECEIVER ?= xuelin@adamanteye.cc
PWD := $(shell pwd)
HOST := $(shell uname -n)
SHELL := /bin/bash

define with_mail
    @raw_name='$(if $(strip $(CMD_LABEL)),$(CMD_LABEL),$(CMD))'; \
    jobname="$$$(printf '%s' "$$raw_name" \
    | tr '\n' ' ' \
    | sed 's/[[[:space:]]\+//g; s/^ //; s/ $$$//' \
    | sed 's/[^[:alnum:]._-]/-/g; s/-\{2,\}/-/g; s/^-//; s/-$$$//' \
    | cut -c1-40)"; \
    started="$$$(date +%Y%m%dT%H%M%S%Z)"; \
    [ -n "$$jobname" ] || jobname=null; \
    log="$(PWD)/$$jobname-$$started.log"; \
    set -o pipefail; \
    if { $(CMD); } 2>&1 | tee "$$log"; then \
        printf '%-6s %s\n' "OK" "$(CMD)"; \
    else \
        printf '%-6s %s\n' "Err" "$(CMD)"; \
        { \
            printf 'Subject: Job %s at %s failed on $(HOST)\n' "$$jobname" "$$started"; \
            printf '\n'; \
            printf 'Command: $(CMD)\n'; \
            printf 'Working dir: $(PWD)\n'; \
            printf 'Log file: %s\n' "$$log"; \
            printf '\n'; \
            printf 'Last 100 lines of log:\n\n'; \
            tail -n 100 "$$log"; \
        } | sendmail "$(RECEIVER)"; \
    fi
endef
```

The idea is to wrap a shell command in a small helper macro. It does three things:

- gives the job a readable name,
- saves stdout/stderr to a log file,
- emails the user if the job fails.

This is useful for running batch jobs. Compared with running commands directly, this approach keeps the make interface while also preserving a log and a failure notification path.

3. Example Usage

```
ifeq ($(V),y)
  Q :=
else
  Q := @
endif
include mail.mk
.PHONY: ok err

err: CMD_LABEL = test
err: CMD = echo "hello,world" && exit 42
err:
  $(Q)$(with_mail)

ok: CMD = echo "hello,world"
ok:
  $(Q)$(with_mail)
```

The example output email is:

Subject: Job test at 20260307T124008CST failed on adamanteye

Command: echo "hello,world" && exit 42

Working dir: /home/xuelin/test

Log file: /home/xuelin/test/fail-test-20260307T124008CST.log

Last 100 lines of log:

hello,world