

Email Address Validation (Pre-Send Gate)

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Owner: CodeCraft (tooling) **Implemented:** 2026-04-18 (after Quran outreach 2-bounce incident)
Script: `~/system/tools/email-address-validate.js` **Cache:** `~/system/databases/email-address-cache.sqlite` (7-day TTL)

Why

First-send to uncatalogued institutional addresses (Al-Burhan, FIN Sarajevo) bounced because of typo/wrong-user assumptions. Adding an MX-lookup gate in front of SMTP send catches that class of failure before a message leaves the building.

What it does

Layer	Catches	Cost
Syntax check (RFC 5322 simplified)	<code>invalid@</code> or missing domain	negligible
DNS MX lookup	Nonexistent domain, missing MX records	~50–200 ms first time, cached after
SMTP RCPT probe (optional, <code>--probe</code>)	Hard 550 rejections on strict servers	~1–5 s
Cache	Repeat validation on known addresses	0 ms

What it does NOT catch

Gmail-hosted domains respond `250 accepted` to RCPT even for nonexistent recipients. The real NDR arrives seconds/minutes later from the submission pipeline. Since many academic/institutional domains are on Google Workspace, RCPT probing is not a reliable filter for

the class of errors we hit.

Mitigation: the validator prints a WARN when sending to a first-seen Gmail-hosted address, instructing the caller to verify manually.

Integration

`mail-native.js sendEmail()` calls the validator before the Himalaya/SMTP path. Hard-block on `exit=1` (no MX / syntax). `--force` bypasses.

CLI

```
node ~/system/tools/email-address-validate.js <email>           # syntax + MX, cached
node ~/system/tools/email-address-validate.js <email> --probe  # + SMTP RCPT (see caveat
above)
node ~/system/tools/email-address-validate.js <email> --force  # skip cache
```

Exit codes: 0 valid, 1 invalid, 2 transient/unknown.

Related

- `~/system/docs/quran-research/` — the outbound sprint that exposed the gap.
- `~/system/tools/email-safety.js` — existing content/subject gates.

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