

# draft-ietf-sml-structured-email-01

IETF 119

# Status

- Scope: Main specification for structured email → allow to describe content of email messages in a machine-readable format
- Updates since IETF 118
  - Draft got adopted by WG 🎉
  - Some minor fixes/restructuring
  - First Open Source implementation released 🎉 (Roundcube Webmail):  
[https://structured.email/tools/email\\_clients.html#webmail](https://structured.email/tools/email_clients.html#webmail)

# Structured data representation

- Issues
  - Serialization (JSON-LD / Microdata)
    - <https://github.com/hhappel/draft-happel-structured-email/issues/1>
  - Placement in MIME messages (embedding; multipart/alternative, ...)
    - <https://github.com/hhappel/draft-happel-structured-email/issues/3>
- Status
  - General trade-offs discussed at IETF 119
  - Currently gathering data about potential backwards compatibility (existing messages; client/library implementations)
  - Input appreciated

# Structured data representation: Language and serialization

- Formal language: RDF (W3C standard)
- Serialization formats: **JSON-LD**, **Microdata**, Others (RDF-XML, Turtle, ...)
- Options
  - Focus on JSON-LD (SHOULD? MUST?)
  - Also allow Microdata?
    - Technically different workflow for tools (c.f. [https://structured.email/tools/email\\_senders.html](https://structured.email/tools/email_senders.html))
    - Anecdotal empirics: used by: Easyjet, HRS, Lufthansa, Ryanair
- See also: <https://github.com/hhappel/draft-happel-structured-email/issues/1>

# Structured data representation: Vocabularies

- Proposal
  - Recommend Schema.org if it fits the sender's use case
  - Allow any vocabulary otherwise, similar to MIME body parts
  - IANA registry?
- See also: <https://github.com/hhappel/draft-happel-structured-email/issues/2>

# Structured data in messages: Placement

- “Partial representation” - options:
  - Embed JSON-LD in text/html SCRIPT-tag
    - Pro: already in use; more legacy software-friendly
  - Leverage “multipart/related”
    - Pro: “clean”
  - Corner case: “non representation” (e.g., preemptive vacation notice)
- “Full representation”
  - Add “application/ld+json” to “multipart/alternative”
    - Pro: “clean”
  - Alternative: also embed JSON-LD in text/html SCRIPT-tag
    - Pro: More legacy software-friendly
- See also: <https://github.com/hhappel/draft-happel-structured-email/issues/3>

# Referencing MIME content in structured data

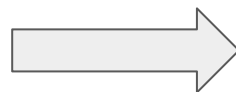
- How to reuse MIME media content in structured data?
- Proposal: use “cid:” URIs in JSON-LD IRIs
  - Should already OK under existing specs
  - Implementation guidance may be helpful if structured data is removed from email context
- See also: <https://github.com/hhappel/draft-happel-structured-email/issues/4>

```
{
  "@context": "http://www.schema.org/",
  "@type": "MusicAlbum",
  "@id": "https://open.spotify.com/album/4F1fUukNCGBD5YjDVi0Jtu",
  "url": "https://open.spotify.com/album/4F1fUukNCGBD5YjDVi0Jtu",
  "name": "Semantics",
  "image": "cid:album-cover"
}
```

# Referencing structured data in messages (1)

and plump, tender shrimp, she pairs smoked paprika with lemon juice for a bright and earthy edge. She says it serves four but, let's be real, that's just a suggestion.

In the recipe notes for Kay Chun's [sheet-pan chopped salad with chicken](#) and a feta topping, you'll find a lively debate about whether to replace the zucchini with olives. Personally, I'd use both, but then I'm a known maximalist when it comes to [sheet-pan meals](#). Kay's



```
{
  "@context": "http://www.schema.org/",
  "@type": "Recipe",
  "@id": "https://cooking.nyt.com/
/sheet-pan-chopped-salad",
  "name": "Sheet-Pan Chopped Salad with
Chicken", (...)
}
```

- Proposal: use “data-id” of HTML elements to reference JSON-LD entities
  - `<a data-id="https://cooking.nyt.com/sheet-pan-chopped-salad" href="...">sheet-...</a>`
  - Con: HTML sanitization issue in MUAs?
  - See also: <https://github.com/hhappel/draft-happel-structured-email/issues/5>



# Referencing structured data in messages (2)

- How to avoid design inconsistencies in partial representation?

In the recipe notes for Kay Chun's [sheet-pan chopped salad with chicken](#) and a feta topping, you'll find a lively debate about

whether  
but the  
Kay's cr  
are brie  
dressing  
ingredie

Recipe 📖



### Sheet-Pan Chopped Salad With Chicken

A vibrant mix of vegetables roast alongside chicken in this recipe, transforming into a warm chopped salad. Quickly marinated chicken breast pieces stay juicy and moist during cooking, emerging with the texture of chicken that has been gently poached. Zucchini and bell peppers release flavorful juices as they cook; the resulting liquid gets transformed into a tangy vinaigrette that comes together in the pan. Leftovers are great

[View Recipe](#)



### Sheet-Pan Chopped Salad With Chicken

By Kay Chun

Recipe 📖



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[View Recipe](#)

- Proposal: specify hint on extend of presentation in HTML
  - `<a data-id="https://cooking...." data-presentation="reference" href="...">`

# Structured data across email messages: Forwarding

- Treatment of structured data on (manual) forwarding
  - Keeping might be desired in many use cases (e.g., “share by email”)
  - Stripping might be desired in certain use cases
    - E.g. privacy issues in “on-representation” cases, where structured data is not obvious from HTML content (e.g., preemptive vacation notice)
  - No way to change behaviour of legacy email clients
- Any relation to automatic forwarding?
- See also <https://github.com/hhappel/draft-happel-structured-email/issues/6>

# Structured data across email messages: Replies

- Structured email sent in response to a structured email
  - Based on “potentialAction”
- Capturing reply status
  - “\Answered” flag defined for conventional replies (RFC 9051)
  - Proposal: Adding \$AnsweredStructured
- See also: <https://github.com/hhappel/draft-happel-structured-email/issues/7>

# Structured data across email messages: Error replies

- An original sender may not assume that a structured email has been processed by a recipient
- But: if a recipient answers with a structured email response, she may want to be informed if this response is invalid for some reason (in order to **avoid the false assumption of a proper reply**)
- Options
  - Define error based on DSN/MDN
  - Define structured data error type
- See also <https://github.com/hhappel/draft-happel-structured-email/issues/8>

# Structured data across email messages: Updates

- Human readable messages can be recalled/corrected by a follow-up human readable message
- How to recall/update structured information in a machine-readable way?
- Options
  - Use SUPERSEDES header (RFC4021)?
- Potential side issues (answered? forwarded? ...)
- See also <https://github.com/hhappel/draft-happel-structured-email/issues/9>

# Processing considerations

- Structured data may be processed on server- or client-side
  - Similar challenges in Calendaring (iMIP) or MDN
- Machine-derived structured data
  - Some ISPs and tools derive structured data from semi-structured content (text, images, attachments)
- Metadata helpful to optimize/enable processing
  - \$hasStructuredData (Similar to \$hasAttachments)
- Might mostly be solved by defining appropriate flags
  - See also: <https://github.com/hhappel/draft-happel-structured-email/issues/10>
  - Larger question: storing/retrieving structured data independent of the message store?

# Action considerations

- “Conventional” emails can contain “materialized actions” (links); e.g.:
  - “Geo:-27.47,153.01” (URI scheme)
  - [https://www.google.com/maps/place/Brisbane+Convention+%26+Exhibition+Centre/\(...\)](https://www.google.com/maps/place/Brisbane+Convention+%26+Exhibition+Centre/(...))
- Structured data provides abstract representation
  - Allows for different materializations
- Observation: missing or inadequate URI schemes for many common use cases
  - E.g. “spotify://” but not “music://”

```
{
  "@context": "https://schema.org",
  "@type": "Place",
  "geo": {
    "@type": "GeoCoordinates",
    "latitude": "-27.47",
    "longitude": "153.01"
  },
  "name": "Brisbane C&E Centre"
}
```

# Next steps

- Further topics?
- Base questions on structured data representation and placement should be sufficiently clear
  - Some debate on existing options
  - Additional vendor feedback might be helpful
  - Decide until/at IETF 120?
- Issues relation to identifiers and particularly structured data across messages
  - Need feedback and input