

Web Bot Auth
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Registry and Signature Agent card for Web bot auth
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Abstract

This document describes a JSON based format for clients using [DIRECTORY] to advertise information about themselves.

This document describes a JSON-based "Signature Agent Card" format for signature agent using [DIRECTORY] to advertise metadata about themselves. This includes identity, purpose, rate expectations, and cryptographic keys. It also establishes an IANA registry for Signature Agent Card parameters, enabling extensible and interoperable discovery of agent information.

About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at <https://thibmeu.github.io/http-message-signatures-directory/draft-meunier-webbotauth-registry.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-meunier-webbotauth-registry/>.

Discussion of this document takes place on the Web Bot Auth Working Group mailing list (<mailto:web-bot-auth@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/web-bot-auth/>. Subscribe at <https://www.ietf.org/mailman/listinfo/web-bot-auth/>.

Source for this draft and an issue tracker can be found at <https://github.com/thibmeu/http-message-signatures-directory>.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

Signature Agents are entities that originate or forward signed HTTP requests on behalf of users or services. They include bots developers, platforms providers, and other intermediaries using [DIRECTORY]. These agents often need to identify themselves, and establish trust with origin servers.

Today, the mechanisms for doing so are inconsistent: some rely on User-Agent strings (e.g. MyCompanyBot/1.0), others on IP address lists hosted on file servers (e.g. badbots.com), and still others on out-of-band definitions (e.g. documentation on docs.example.com/mybot). This diversity makes it difficult for operators and origin servers to reliably discover and share a Signature Agent's purpose, contact information, or rate expectations. Existing discovery mechanisms, such as [OPENID-CONNECT-DISCOVERY], do not have the necessary granularity, and pursue different goals.

This document introduces a JSON-based "Signature Agent Card" format for Signature Agents, to be published in registries and discovered by servers. It also creates a new IANA registry of "Signature Agent Card Parameters" to ensure extensibility and consistency of future attributes.

2. Conventions and Definitions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Signature Agent Card

Signature-Agent header is defined in Section 4.1 of [DIRECTORY]. This section describes Signature Agent Card, a JSON object containing parameters describing the Signature Agent.

```
{
  "client_name": "Example Bot",
  "client_uri": "https://example.com/bot/about.html",
  "logo_uri": "https://example.com/",
  "contacts": ["mailto:bot-support@example.com"],
  "expected-user-agent": "Mozilla/5.0 ExampleBot",
  "rfc9309-product-token": "ExampleBot",
  "rfc9309-compliance": ["User-Agent", "Allow", "Disallow", "Content-Usage"],
  "trigger": "fetcher",
  "purpose": "tdm",
  "targeted-content": "Cat pictures",
  "rate-control": "429",
  "rate-expectation": "avg=10rps;max=100rps",
  "known-urls": ["/", "/robots.txt", "*.png"],
  "keys": [{
    "kty": "OKP",
    "crv": "Ed25519",
    "kid": "NFcWBst6DXG-N35nHdzMrioWntdzNZghQSkjHNMMSjw",
    "x": "JrQLj5P_89iXES9-vFgrIy29clF9CC_oPPsw3c5D0bs",
    "use": "sig",
    "nbf": 1712793600,
    "exp": 1715385600
  }]
}
```

Unless otherwise specified, all parameters in this document are OPTIONAL. There MUST be at least one parameter set.

Parameters for which the value is unknown MUST be ignored. All string values are UTF-8.

3.1. Client Name

The `client_name` parameter provides a friendly identifier for the Signature Agent.

Example

- * ExampleBot
- * My remote browser company

3.2. Client URI

The `client_uri` parameter provides inline content or a web page describing the bot: e.g. what does it do, how it handles data it fetches.

Only `http`, `https` or `data:text/plain` are allowed.

Example

- * `https://example.com/bot/about.html`
- * `data:text/plain,The Example bot is about providing an example.`

3.3. Contacts

The `contacts` parameter provides reliable communication channels in URI forms. Typically, this is an email address.

Example

- * `["mailto:bot-support@example.com"]`
- * `["https://example.com/contact"]`

3.4. Logo URI

The `logo_uri` parameter provides an image reference for visual identification.

TODO: Recommendation for size and format, if there is a clear consensus or reference we can point to.

Example

- * ``
- * `https://example.com/logo.png`

3.5. Expected user agent

The `expected-user-agent` parameter specifies one or more User-Agent strings as defined in Section 10.1.5 of [HTTP] or prefix matches. Prefixes MAY use `*` as a wildcard.

Example

- * `Mozilla/5.0 ExampleBot`

3.6. robots.txt product token

The rfc9309-product-token parameter specifies the product token used for robots.txt directives per Section 2.2.1 of [ROBOTSTXT].

Example

```
* ExampleBot
```

3.7. robots.txt compliance

The rfc9309-compliance parameter lists directives from robots.txt that the agent implements.

Example

```
* ["User-Agent", "Disallow"]  
  
* ["User-Agent", "Disallow", "CrawlDelay"]
```

3.8. Trigger

The trigger parameter indicates the operational mode of the agent.

Valid values:

1. fetcher - request initiated by the user
2. crawler - autonomous scanning

3.9. Purpose

The purpose parameter describes the intended use of collected data. Values SHOULD be drawn from a controlled vocabulary, such as [AIPREF-VOCAB].

Example

```
* search  
  
* tdm
```

3.10. Targeted content

The targeted-content parameter specifies the type of data the agent seeks. Its format is arbitrary UTF-8 encoded string.

Example

- * SEO analysis
- * Vulnerability scanning
- * Ads verification

3.11. Rate control

The rate-control parameter indicates how origins can influence the agent's request rate.

TODO: specify a format

Example

- * CrawlDelay in robots.txt (non-standard)
- * Custom tool
- * 429 + [RATELIMIT-HEADER]

3.12. Rate expectation

The rate-expectation parameter specifies anticipated request volume or burstiness.

TODO: consider a format such as avg=10rps;max=100rps

Example

- * 500 rps
- * Spikes during reindexing

3.13. Known URLs

The known-urls parameter lists predictable endpoints accessed by the agent.

These URLs may be absolute URLs like `https://example.com/index.html`. They could be relative path like `/ads.txt`. Or they can use `*` as wildcard such as `*.png`.

Example

- * ["/"]
- * ["/ads.txt"]

- * ["/favicon.ico"]
- * ["/index.html"]

3.14. Keys

The keys parameter contains a JWKS as defined in Section 5 of [JWK].

If keys is present, it is RECOMMENDED that the card is signed using [HTTP-MESSAGE-SIGNATURES]. Content-Digest header MUST be included in the covered components.

TODO: describe signature, CWS keys.

Example

- * https://example.com/.well-known/http-message-signatures-directory
- * JWKS-directory

4. Discovery

A registry is a list of URLs, each refering to a signature agent card.

The URI scheme MUST be one of:

- * https (RECOMMENDED): Points to an HTTPS resource serving a signature agent card
- * http: Points to an HTTP resource serving a signature agent card
- * data: Contains an inline signature agent card

Example

```
# An example list of bots
https://bot1.example.com/.well-known/signature-agent-card
https://crawler2.example.com/.well-known/signature-agent-card

# Now the list of platforms
https://zerotrust-gateway.example.com/.well-known/signature-agent-card

# Below is an inlined card with the data URL scheme
data:application/json;,... # Invalid, not defined
```


4.1. Formal Syntax

Below is an Augmented Backus-Naur Form (ABNF) description, as described in [ABNF].

The below definition imports http-URI and https-URI from [HTTP], and dataurl from [DATAURL].

```
registry = *(cardendpointline / emptyline)
cardendpointline = (
    http-URI /           ; As defined in Section 4.2.1 of RFC 9110
    https-URI /          ; As defined in Section 4.2.2 of RFC 9110
    dataurl               ; As defined in Section 3 of RFC 2397
) EOL

comment = "#" *(UTF8-char-noctl / WS / "#")
emptyline = EOL
EOL = *WS [comment] NL ; end-of-line may have
                        ; optional trailing comment
NL = %x0D / %x0A / %x0D.0A
WS = %x20 / %x09

; UTF8 derived from RFC 3629, but excluding control characters

UTF8-char-noctl = UTF8-1-noctl / UTF8-2 / UTF8-3 / UTF8-4
UTF8-1-noctl = %x21 / %x22 / %x24-7F ; excluding control, space, "#"
UTF8-2 = %xC2-DF UTF8-tail
UTF8-3 = %xE0 %xA0-BF UTF8-tail / %xE1-EC 2UTF8-tail /
        %xED %x80-9F UTF8-tail / %xEE-EF 2UTF8-tail
UTF8-4 = %xF0 %x90-BF 2UTF8-tail / %xF1-F3 3UTF8-tail /
        %xF4 %x80-8F 2UTF8-tail

UTF8-tail = %x80-BF
```

4.2. Out-of-band communication between client and origin

A signature agent MAY submit their signature agent card to an origin, or the origin MAY manually add them to their local registry.

4.3. Public list

A registry MAY be provided via a GitHub repository, a public file server, or a dedicated endpoint.

The registry SHOULD be served over HTTPS.

A client application SHOULD validate the directory format and reject malformed entries.

4.4. Signature-Agent header

Signature Agent Card format defined in Section 3 extends the format of Signature-Agent header as defined in Section 4.1 of [DIRECTORY].

When used for HTTP Message Signatures, and hosted on a well-known URL, Signature Agent Card MAY be discovered via a Signature-Agent header.

5. Security Considerations

Malicious actors may put properties which are not theirs in the registry. If signatures are present, clients MUST verify them. Clients SHOULD reject cards with invalid signatures.

6. Privacy Considerations

TODO

7. IANA Considerations

7.1. Registration template

New registrations need to list the following attributes:

Parameter Name: The name requested (e.g. "useragent"). This name is case sensitive. Names may not match other registered names in a case-insensitive manner unless the Designated Experts state that there is a compelling reason to allow an exception

Parameter Description: Brief description of the Header Parameter

Change Controller: For Standards Track RFCs, list the "IESG". For others, give the name of the responsible party. Other details (e.g., postal address, email address, home page URI) may also be included.

Reference: Where this parameter is defined

Notes: Any notes associated with the entry

New entries in this registry are subject to the Specification Required registration policy ([RFC8126], Section 4.6). Designated experts need to ensure that the token type is defined to be used for both token issuance and redemption. Additionally, the experts can reject registrations on the basis that they do not meet the security and privacy requirements defined in TODO.

7.1.1. Initial Registry content

This section registers the Signature Agent Card Parameter names defined in Section 3 in this registry.

7.1.1.1. Client Name Parameter

Parameter Name: client_name

Parameter Description: A friendly name for your signature agent.

Change Controller: IETF

Reference: Section 3.1

Notes: N/A

7.1.1.2. Client URI Parameter

Parameter Name: client_uri

Parameter Description: Describes what the bot does inline with data URI or with an HTTP link to an external resource

Change Controller: IETF

Reference: Section 3.2

Notes: N/A

7.1.1.3. Logo URI Parameter

Parameter Name: logo_uri

Parameter Description: Image for a quick visual identification

Change Controller: IETF

Reference: Section 3.4

Notes: N/A

7.1.1.4. Contacts Parameter

Parameter Name: contacts

Parameter Description: An array of URI with a reliable communication channel; typically email addresses

Change Controller: IETF

Reference: Section 3.3

Notes: N/A

7.1.1.5. Expected User Agent Parameter

Parameter Name: expected-user-agent

Parameter Description: String or fragment patterns

Change Controller: IETF

Reference: Section 3.5

Notes: N/A

7.1.1.6. RFC9309 Product Token Parameter

Parameter Name: rfc9309-product-token

Parameter Description: Robots.txt product token your signature-agent satisfies.

Change Controller: IETF

Reference: Section 3.6

Notes: N/A

7.1.1.7. RFC9309 Compliance Parameter

Parameter Name: rfc9309-compliance

Parameter Description: Does your signature-agent respect robots.txt.

Change Controller: IETF

Reference: Section 3.7

Notes: N/A

7.1.1.8. Trigger Parameter

Parameter Name: trigger

Parameter Description: Fetcher/Crawler

Change Controller: IETF

Reference: Section 3.8

Notes: N/A

7.1.1.9. Purpose Parameter

Parameter Name: purpose

Parameter Description: Intended use for the collected data

Change Controller: IETF

Reference: Section 3.9

Notes: N/A

7.1.1.10. Targeted Content Parameter

Parameter Name: targeted-content

Parameter Description: Type of data your agent seeks

Change Controller: IETF

Reference: Section 3.10

Notes: N/A

7.1.1.11. Rate control Parameter

Parameter Name: rate-control

Parameter Description: How can an origin control your crawl rate

Change Controller: IETF

Reference: Section 3.11

Notes: N/A

7.1.1.12. Rate expectation Parameter

Parameter Name: rate-expectation

Parameter Description: Expected traffic and intensity

Change Controller: IETF

Reference: Section 3.12

Notes: N/A

7.1.1.13. Known URLs Parameter

Parameter Name: known-urls

Parameter Description: Predictable endpoint accessed

Change Controller: IETF

Reference: Section 3.13

Notes: N/A

7.1.1.14. Keys Parameter

Parameter Name: keys

Parameter Description: JWKS Endpoint

Change Controller: IETF

Reference: Section 3.14

Notes: N/A

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Appendix A. Test Vectors

TODO

Appendix B. Implementations

TODO

Acknowledgments

TODO

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Changelog

v01

- * Add contributors
- * Aligning registry draft with oauth dynamic client registration iana registry
- * Add an about-url field
- * Add ABNF for discovery of signature-agent card (registry)
- * Add precisions about known URLs
- * Add placeholder for image size

v00

- * Initial draft

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