Web Bot Auth
Internet-Draft
Intended status: Informational
Expires: 9 March 2026

M. Guerreiro
T. Meunier
Cloudflare

5 September 2025

Registry and Signature Agent card for Web bot auth
draft-meunier-webbotauth-registry-00

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 themselve. 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

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 9 March 2026.

Copyright Notice

Table of Contents

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.

```
{
  "name": "Example Bot",
  "contact": "bot-support@example.com",
  "logo": "https://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. Unknown parameters MUST be ignored. All string values are UTF-8.

3.1. Name

The name parameter provides a friendly identifier for the Signature Agent.

Example

* ExampleBot

* My remote browser company

3.2. Contact

The contact parameter provides an email address or reliable communication channel.

Example * bot-support@example.com * https://example.com/contact

3.3. Logo

The logo parameter provides an image reference for visual identification.

Example

*

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

3.4. 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

3.5. 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

3.6. robots.txt compliance

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

Example

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

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

3.7. Trigger

The trigger parameter indicates the operational mode of the agent.

Valid values:

1. "fetcher" - request initiated by the user

2. "crawler" - autonomous scanning

3.8. 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

3.9. Targeted content

The targeted-content parameter specifies the type of data the agent seeks.

Example

* SEO analysis
* Vulnerability scanning
* Ads verification

3.10. 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]

3.11. 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

3.12. Known URLs

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

Example

* /

* /ads.txt

* /favicon.ico

* /index.html

3.13. 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

Discovery is done via a registry. A registry is a list of URLs, each one pointing to a signature card.

URLS can be:

* https

* http

* data

Example

https://bot1.example.com/.well-known/signature-agent-card
https://crawler2.example.com/.well-known/signature-agent-card
https://zerotrust-gateway.example.com/.well-known/signature-agent-card
data:application/json;,...

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

A service submitting their key to an origin, or the origin manually adding a service to their trusted list.

4.1.1. Public list

Could be a GitHub repository like the public suffix list. The issue is the gating of such repositories, and therefore its governance.

4.1.2. Signature-Agent-Card header

This allows for backward compatibility with existing header agent filtering, and an upgrade to a cryptographically secured protocol.

5. Security Considerations

Malicious actors may put properties which are not theirs in the registry. Client SHOULD verify signature if they are present.

6. Privacy Considerations

TODO

7. IANA Considerations

7.1. Signature Agent Card Parameters Registry

IANA is requested to create a new "Signature Agent Card Parameters" registry in a new "Signature Agent Card" page to list metadata for signature agent protocols.

7.1.1. 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.

7.1.2. Initial Registry content

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

7.1.2.1. Name Parameter

Parameter Name: name

Parameter Description: A friendly name for your signature agent.

Change Controller: IETF

Reference: Section 3.1

Notes: N/A

7.1.2.2. Contact Parameter

Parameter Name: contact

Parameter Description: Email or any other reliable communication channel

Change Controller: IETF

Reference: Section 3.2

Notes: N/A

7.1.2.3. Logo Parameter

Parameter Name: logo

Parameter Description: Image for a quick visual identification

Change Controller: IETF

Reference: Section 3.3

Notes: N/A

7.1.2.4. Expected User Agent Parameter

Parameter Name: expected-user-agent

Parameter Description: String or fragment patterns

Change Controller: IETF

Reference: Section 3.4

Notes: N/A

7.1.2.5. RFC9309 Product Token Parameter

Parameter Name: rfc9309-product-token

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

Change Controller: IETF

Reference: Section 3.5

Notes: N/A

7.1.2.6. RFC9309 Compliance Parameter

Parameter Name: rfc9309-compliance

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

Change Controller: IETF

Reference: Section 3.6

Notes: N/A

7.1.2.7. Trigger Parameter

Parameter Name: trigger

Parameter Description: Fetcher/Crawler

Change Controller: IETF

Reference: Section 3.7

Notes: N/A

7.1.2.8. Purpose Parameter

Parameter Name: purpose

Parameter Description: Intended use for the collected data

Change Controller: IETF

Reference: Section 3.8

Notes: N/A

7.1.2.9. Targeted Content Parameter

Parameter Name: targeted-content

Parameter Description: Type of data your agent seeks

Change Controller: IETF

Reference: Section 3.9

Notes: N/A

7.1.2.10. Rate control Parameter

Parameter Name: rate-control

Parameter Description: How can an origin control your crawl rate

Change Controller: IETF

Reference: Section 3.10

Notes: N/A

7.1.2.11. Rate expectation Parameter

Parameter Name: rate-expectation

Parameter Description: Expected traffic and intensity

Change Controller: IETF

Reference: Section 3.11

Notes: N/A

7.1.2.12. Known URLs Parameter

Parameter Name: known-urls

Parameter Description: Predictable endpoint accessed

Change Controller: IETF

Reference: Section 3.12

Notes: N/A

7.1.2.13. Keys Parameter

Parameter Name: keys

Parameter Description: JWKS Endpoint

Change Controller: IETF

Reference: Section 3.13

Notes: N/A

8. References

8.1. Normative References

[AIPREF-VOCAB]
Keller, P. and M. Thomson, "A Vocabulary For Expressing AI Usage Preferences", Work in Progress, Internet-Draft, draft-ietf-aipref-vocab-03, 4 September 2025, <https://datatracker.ietf.org/doc/html/draft-ietf-aipref-vocab-03>.

[DIRECTORY]
Meunier, T., "HTTP Message Signatures Directory", Work in Progress, Internet-Draft, draft-meunier-http-message-signatures-directory-03, 5 September 2025, <https://datatracker.ietf.org/doc/html/draft-meunier-http-message-signatures-directory-03>.

[HTTP] Fielding, R., Ed., Nottingham, M., Ed., and J. Reschke, Ed., "HTTP Semantics", STD 97, RFC 9110, DOI 10.17487/RFC9110, June 2022, <https://www.rfc-editor.org/rfc/rfc9110>.

[HTTP-CACHE]
Fielding, R., Ed., Nottingham, M., Ed., and J. Reschke, Ed., "HTTP Caching", STD 98, RFC 9111, DOI 10.17487/RFC9111, June 2022, <https://www.rfc-editor.org/rfc/rfc9111>.

[HTTP-MESSAGE-SIGNATURES]
Backman, A., Ed., Richer, J., Ed., and M. Sporny, "HTTP Message Signatures", RFC 9421, DOI 10.17487/RFC9421, February 2024, <https://www.rfc-editor.org/rfc/rfc9421>.

[HTTP-MORE-STATUS-CODE]
Nottingham, M. and R. Fielding, "Additional HTTP Status Codes", RFC 6585, DOI 10.17487/RFC6585, April 2012, <https://www.rfc-editor.org/rfc/rfc6585>.

[JWK] Jones, M., "JSON Web Key (JWK)", RFC 7517, DOI 10.17487/RFC7517, May 2015, <https://www.rfc-editor.org/rfc/rfc7517>.

[JWK-OKP] Liusvaara, I., "CFRG Elliptic Curve Diffie-Hellman (ECDH) and Signatures in JSON Object Signing and Encryption (JOSE)", RFC 8037, DOI 10.17487/RFC8037, January 2017, <https://www.rfc-editor.org/rfc/rfc8037>.

[JWK-THUMBPRINT]
Jones, M. and N. Sakimura, "JSON Web Key (JWK) Thumbprint", RFC 7638, DOI 10.17487/RFC7638, September 2015, <https://www.rfc-editor.org/rfc/rfc7638>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/rfc/rfc2119>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/rfc/rfc8126>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/rfc/rfc8174>.

8.2. Informative References

[OAUTH-BEARER]
Jones, M. and D. Hardt, "The OAuth 2.0 Authorization Framework: Bearer Token Usage", RFC 6750, DOI 10.17487/RFC6750, October 2012, <https://www.rfc-editor.org/rfc/rfc6750>.

[OPENID-CONNECT-DISCOVERY]
"OpenID Connect Discovery 1.0", n.d., <https://openid.net/specs/openid-connect-discovery-1_0.html>.

[RATELIMIT-HEADER]
Polli, R., Ruiz, A. M., and D. Miller, "RateLimit header fields for HTTP", Work in Progress, Internet-Draft, draft-ietf-httpapi-ratelimit-headers-09, 17 March 2025, <https://datatracker.ietf.org/doc/html/draft-ietf-httpapi-ratelimit-headers-09>.

[RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", RFC 8446, DOI 10.17487/RFC8446, August 2018, <https://www.rfc-editor.org/rfc/rfc8446>.

[ROBOTSTXT]
Koster, M., Illyes, G., Zeller, H., and L. Sassman, "Robots Exclusion Protocol", RFC 9309, DOI 10.17487/RFC9309, September 2022, <https://www.rfc-editor.org/rfc/rfc9309>.

Appendix A. Test Vectors

TODO

Appendix B. Implementations

TODO

Acknowledgments

TODO

The editor would also like to thank the following individuals (listed in alphabetical order) for feedback, insight, and implementation of this document -

Changelog

v00

* Initial draft

Authors' Addresses

Maxime Guerreiro
Cloudflare
Email: maxime.guerreiro@gmail.com

Thibault Meunier
Cloudflare
Email: ot-ietf@thibault.uk