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**Indicating WebSocket Protocol as a Transport in the Session Initiation
Protocol (SIP) Common Log Format (CLF)
draft-salgueiro-dispatch-websocket-sipclf-00**

Abstract

[RFC 7118](#) [[RFC7118](#)] specifies a WebSocket sub-protocol as a reliable real-time transport mechanism between SIP (Session Initiation Protocol) entities to enable usage of SIP in web-oriented deployments. This document updates the SIP Common Log Format (CLF), defined in [RFC 6873](#) [[RFC6873](#)], with a new "Transport Flag" for such SIP WebSocket transport.

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[1.](#) Introduction

The WebSocket protocol [[RFC6455](#)] enables two-way message exchange between clients and servers on top of a persistent TCP connection (optionally secured with TLS [[RFC5246](#)]). The initial protocol handshake makes use of HTTP [[RFC2616](#)] semantics, allowing the WebSocket protocol to reuse existing HTTP infrastructure.

[RFC 7118](#) [[RFC7118](#)] defines a WebSocket sub-protocol for transporting SIP messages between a WebSocket client and server.

SIP messages can be logged using the Common Log Format defined in [RFC 6873](#) [[RFC6873](#)]. In order to make such SIP CLF logging possible for SIP messages transported over the WebSocket protocol, a new WebSocket "Transport Flag" ('W') must be added to the "Transport Flags" already defined in [RFC 6873](#) [[RFC6873](#)] (i.e., UDP, TCP and SCTP).

This document updates [RFC 6873](#) [[RFC6873](#)] by defining a new SIP CLF "Transport Flag" value for WebSocket.

[2.](#) Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

3. Document Conventions

This document details several examples of SIP CLF records showing messages over plain and secure WebSocket connections. The formatting described in this document does not permit the examples to be unambiguously rendered due to the constraints imposed by the formatting rules for RFCs. To avoid ambiguity and to meet the RFC layout requirements, this document uses the `<allOneLine/>` markup convention established in [\[RFC4475\]](#). This markup convention is described in detail in [Section 3 of RFC 6873 \[RFC6873\]](#) and used throughout that document for representing the syntax of SIP CLF records.

4. Usage of the WebSocket Transport Flag

[Section 4.2 of RFC6873 \[RFC6873\]](#) specifies the mandatory fields in a SIP CLF record. The fourth and fifth bytes of the five byte "Flags Field" are the "Transport Flag" and the "Encryption Flag" respectively. SIP messages transported over both a plain and secure WebSocket connection can be completely and uniquely represented by appropriately setting these two flag fields.

The currently registered values of the "Transport Flag" ([Section 9.2 of RFC 6873](#)) are [UDP ('U'), TCP ('T'), and SCTP ('S')]. This document defines and registers a new "Transport Flag" value 'W' for WebSocket transport of SIP messages and consequently updates [RFC 6873 \[RFC6873\]](#) and the IANA "SIP CLF Transport Flag Values" registry.

SIP CLF records of messages transported over a plain WebSocket connection (WS) MUST set the "Transport Flag" to this new 'W' value and the "Encryption Flag" value to 'U' (Unencrypted). SIP CLF records of messages transported over a secure WebSocket (WSS) connection (i.e. WS over TLS) MUST set the "Transport Flag" to this new 'W' value and the "Encryption Flag" value to 'E' (Encrypted).

5. Examples

The following examples show sample SIP CLF records logged for SIP messages transported over both plain and secure WebSocket connections.

5.1. SIP over WebSocket (WS)

The following example represents a SIP INVITE request sent over a plain WebSocket connection. For the sake of brevity, the Session Description Protocol (SDP) [\[RFC4566\]](#) body is omitted.


```

INVITE sip:bob@example.com SIP/2.0
Via: SIP/2.0/WS df7jal23ls0d.invalid;branch=z9hG4bK56sdasks
From: sip:alice@example.com;tag=asdyka899
To: sip:bob@example.com
Call-ID: asidkj3ss
CSeq: 1 INVITE
Max-Forwards: 70
Date: Thu, 6 Feb 2014 15:02:03 GMT
Supported: path, outbound, gruu
Route: <sip:proxy.example.com:80;transport=ws;lr>
Contact: <sip:alice@example.com;gr=urn:uuid:f81-7dec-14a06cf1;ob>
Content-Type: application/sdp
Content-Length: 418

```

Shown below is approximately how this message would appear as a single record in a SIP CLF logging file if encoded according to the syntax described in [[RFC6873](#)]. Due to RFC conventions, this log entry has been split into five lines, instead of the two lines that actually appear in a log file; and the Tab characters have been padded out using spaces to simulate their appearance in a text terminal.

```

A0000E7,0053005C005E00720080009200A600A800BE00C800D200DE00E7
<allOneLine>
1328821153.010      RORWU      1 INVITE      -      sip:bob@example.com
192.0.2.10:80      192.0.2.200:56485      sip:bob@example.com      -
sip:alice@example.com      asdyka899      asidkj3ss      S1781761-88
C67651-11
</allOneLine>

```

A bit-exact version of the actual log entry is provided here, Base64 encoded.

```

begin-base64 644 clf_ws_record
QTAWMDBFNywwMDUzMdA1QzAwNUUwMDcyMDA4MDAwOTIwMEE2MDBBODAwQkUwMEM4MDE
MjAwREUwMEU3CjEzMjg4MjExNTMuMDEwCVJPUldVCTEgSU5WSVRFCs0Jc2lwOmJvYkBl
eGFtcGx1LmNvbQkxOTIuMC4yLjEwOjgwCTE5Mi4wLjIuMjAwOjU2NDg1CXNpcDpib2JA
ZXhhbXBsZS5jb20JLQlzaXA6YWxpY2Y2VAZXhhbXBsZS5jb20JYXNkeWthODk5CWFzaWRr
ajNzcwltMTc4MTc2MS04OAlDNjc2NTEtMTEKCG==
====

```


5.2. SIP over Secure WebSocket (WSS)

The following example represents a SIP INVITE request sent over a secure WebSocket connection (i.e., WebSocket over TLS [[RFC5246](#)]). For the sake of brevity, the SDP body is omitted.

```
INVITE sip:bob@example.com SIP/2.0
Via: SIP/2.0/WSS df7jal23ls0d.invalid;branch=z9hG4bK56sdasks
From: sip:alice@example.com;tag=asdyka899
To: sip:bob@example.com
Call-ID: asidkj3ss
CSeq: 1 INVITE
Max-Forwards: 70
Date: Thu, 6 Feb 2014 15:02:03 GMT
Supported: path, outbound, gruu
Route: <sip:proxy.example.com:443;transport=ws;lr>
Contact: <sip:alice@example.com;gr=urn:uuid:f81-7dec-14a06cf1;ob>
Content-Type: application/sdp
Content-Length: 439
```

Shown below is approximately how this message would appear as a single record in a SIP CLF logging file if encoded according to the syntax described in [[RFC6873](#)]. Due to RFC conventions, this log entry has been split into five lines, instead of the two lines that actually appear in a log file; and the Tab characters have been padded out using spaces to simulate their appearance in a text terminal.

```
A0000E8,0053005C005E00720081009300A700A900BF00C900D300DF00E8
<allOneLine>
1328821153.010      RORWE      1 INVITE      -      sip:bob@example.com
192.0.2.10:443      192.0.2.200:56485      sip:bob@example.com      -
sip:alice@example.com:5060      asdyka899      asidkj3ss      S1781761-88
C67651-11
</allOneLine>
```

A bit-exact version of the actual log entry is provided here, Base64 encoded.


```

begin-base64 644 clf_ws_record
QTAWMDBFOCwwMDUZMDA1QzAwNUUwMDcyMDA4MTAwOTMwMEE3MDBBOTAwQkYwMEM5MDBE
MzAwREYwMEU4CjEzMjg4MjExNTMuMDEwCVJPULdVCTEgSU5WSVRFCs0Jc2lw0mJvYkBl
eGFtcGx1LmNvbQkxOTIuMC4yLjEwOjQ0MwkwOTIuMC4yLjIwMD01NjQ4NQ1zaXA6Ym9i
QGV4YW1wbGUuY29tCS0Jc2lw0mFsaWNIQGV4YW1wbGUuY29tCWFzZHlrYTg5OQ1hc2lk
a2ozc3MJUzE3ODE3NjEtODgJQzY3NjUxLTExCgo=
=====

```

6. Security Considerations

This document merely adds a new "Transport Flag" value for the WebSocket protocol. This value may be set in a SIP CLF record, but its use does not intrinsically introduce and new security considerations. When logging protocol information, such as with SIP CLF, there are a myriad of security, privacy and data protection to consider. These are exhaustively described in [RFC 6872](#) [[RFC6872](#)] and [RFC 6873](#) [[RFC6873](#)].

Any security considerations specific to the WebSocket protocol or its application as a transport for SIP are detailed in the relevant specifications ([RFC 6455](#) [[RFC6455](#)] and [draft-ietf-sipcore-sip-websocket](#) [[RFC7118](#)]) and are considered outside the scope of this document.

7. IANA Considerations

This document defines a new value ('W') for SIP CLF "Transport Flag" and requests IANA to register this value in the registry titled "SIP CLF Transport Flag Values", as shown in Table 1 below.

Value	Transport Protocol	Reference
W	WebSocket	RFCXXXX

Table 1: IANA-Registered SIP CLF Transport Flag

[[NOTE TO RFC EDITOR: Please change XXXX to the number assigned to this specification, and remove this paragraph on publication.]]

8. Acknowledgements

TBD

9. References

9.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
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9.2. Informative References

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