

SIPPING Working Group
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The Session Initiation Protocol (SIP) and Session Description Protocol (SDP) static dictionary for Signaling Compression (SigComp)
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Abstract

The Session Initiation Protocol (SIP) [2] is a text-based protocol for initiating and managing communication sessions. The protocol can be compressed by using Signaling Compression (SigComp) [1]. Similarly, the Session Description Protocol (SDP) [24] is a text-based protocol intended for describing multimedia sessions for the purposes of session announcement, session invitation, and other forms of multimedia session initiation. This memo defines the SIP/SDP-specific static dictionary that SigComp may use in order to achieve higher efficiency. The dictionary is compression algorithm

independent.

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[1. Introduction](#)

SIP [2] and SDP [1] are text-based protocols that use the UTF-8 charset ([RFC 2279](#) [4]). SIP and SDP were designed for rich bandwidth links. However, when SIP/SDP is run over narrow bandwidth links, such as radio interfaces or low speed serial links, the session setup time increases substantially, compared to an operation over a rich bandwidth link.

The session setup time can decrease dramatically if the SIP/SDP signaling is compressed. The signaling compression mechanisms specified in SigComp [1] provide a multiple compression/decompression algorithm framework to compress and decompress text-based protocols such as SIP and SDP.

When compression is used in SIP/SDP, the compression achieves its maximum rate once a few message exchanges have taken place. This is due to the fact that the first message the compressor sends to the decompressor is only partially compressed, as there is not a previous stored state to compress against. As the goal is to reduce the session setup time as much as possible, it seems sensible to investigate a mechanism to boost the compression rate from the first message.

In this memo we introduce the static dictionary for SIP and SDP. The dictionary is to be used in conjunction with SIP, SDP and SigComp. The static SIP/SDP dictionary constitutes a SigComp state that can be referenced in the first SIP message that the compressor sends out.

[2. Design considerations](#)

The static SIP/SDP dictionary is a collection of well-known strings that appear in most of the SIP and SDP messages. The dictionary is

not a comprehensive list of reserved words, but it includes many of the strings that appear in SIP and SDP signaling.

The static dictionary is unique and MUST be available in all SigComp implementations for SIP/SDP. The dictionary is not intended to evolve as SIP or SDP evolve. It is defined once, and stays as is forever. This solves the problems of updating, upgrading and finding out the dictionary that is supported at the remote end when several versions of the same dictionary coexist.

[Appendix A](#) contains the collection of strings that SIP contributed to the static dictionary. The appendix includes references to the documents that define those strings.

[Appendix B](#) contains the collection of strings that SDP contributed to the static dictionary. Again, the appendix includes references to the documents that define those strings.

While these appendices are of an informative nature, [Section 3](#) gives the normative binary form of the SIP/SDP dictionary. This is the dictionary that is included in the SigComp implementation. This dictionary has been formed from the collection of individual dictionaries given in appendices A and B.

The two input collections are collections of UTF-8 encoded character strings. In order to facilitate the readability, the appendices describe them in one table for each collection. In this table, each row represents an entry. Each entry contains the string that actually occurs in the dictionary, its priority (see below), its offset from the first octet and its length (both in hexadecimal), and one or more references that elucidate why this string is expected to occur in SIP/SDP messages.

The columns in the tables are described as follows:

String: represents the UTF-8 string that is inserted into the dictionary. Note that the quotes (") are not part of the string itself. Note also that the notation [CRLF] represents a Carriage Return character (ASCII code 0x0D) followed by a Line Feed character (ASCII code 0x0A).

Pr: indicates the priority of this string within the dictionary. Some compression algorithms, such as DEFLATE, offer an increased efficiency when the most commonly used strings are located at the bottom of the dictionary. To facilitate generating a dictionary that has the most-frequently occurring strings further down at the bottom, we have decided to allocate a priority to each string in the dictionary. Priorities range from 1 until 5. A low number in the priority column (e.g., 1) indicate that we believe in a high probability of finding the string in SIP or SDP messages. A high number in the priority column (e.g., 5) indicates lower probability of finding the string in a SIP or SDP message. This is typically the

case for less frequent error codes or optional infrequent tags.

Off: indicates the hexadecimal offset of the entry with respect the first octet in the dictionary. Note that several strings in the collections can share space in the dictionary if they exhibit suitable common substrings.

Len: the length of the string (in hexadecimal).

References: contains one or more references to the specification and the section within the specification where the string is defined.

Note that the strings stored in the dictionary are case sensitive. (Again, the strings do not comprise the quotes ("), they are just shown here to increase the readability.) Where the string is a header field, we also included the colon ":" and the amount of white space expected to occur. Note that this means that not all messages that conform to the SIP Augmented BNF, which allows other combinations (e.g., a white space or horizontal tabulator before the colon (":") sign), will benefit as much from the dictionary -- the best increase in compression performance is to be expected for messages that use the recommended formatting guidelines for SIP.

Some strings appear followed by an equal sign and some others do not. This depends on whether the string is part of a parameter name or a parameter value.

In a SIP message, all the SIP headers terminate with a CRLF pair of characters. As these characters are appended to the end of each SIP header line, right after the header values, and because the header values are typically not part of the static SIP dictionary, we cannot include the terminating CRLF as part of the SIP static dictionary. Instead, the approach we have taken is to include in each header field entry the CRLF from the previous line that prefixes every header field. We have represented CRLF by the notation [CRLF]. Therefore, in generating the actual binary dictionary, an entry in the dictionary represented as: "[CRLF]From: " has been interpreted as an entry whose value is CR, LF, the word From, a colon and a whitespace.

SIP responses start with a status code (e.g., "302") and a reason phrase (e.g., "Moved Temporarily"). The status code is a normative part, whereas the reason phrase is not normative, it is just a suggested text. For instance, both "302 Moved Temporarily" and "302 Redirect" are valid beginnings of SIP responses.

In the SIP dictionary we have included two entries per response code, one including only the status code and a space (e.g. "302 ") and another one including both the status code and the suggested reason phrase (e.g., "302 Moved Temporarily"). The former can be used when the SIP response changed the suggested reason phrase by another one.

The later can be used when the suggested reason phrase is part of the response. In this way, we accommodate both alternatives. (Note that

in the actual dictionary, both strings occupy the same space in the string subset, but have two separate entries in the table subset.)

3. Binary representation of the SIP/SDP dictionary

This section contains the result of combining the SIP and the SDP dictionaries described in sections 3 and 4 in order to create a single dictionary that is loaded into SigComp as a state.

The binary SigComp dictionary is comprised of two parts, the concatenation of which serves as the state value of the state item: A string subset, which contains all strings in the contributing collections as a substring (roughly ordered such that strings with low priority numbers occur at the end), and a table subset, which contains pairs of offset and length values for all the strings in the contributing collections. The intention is that all compression algorithms will be able to use the (or part of the) string subset, and some compression methods, notably those that are related to the LZ78 family, will also use the table in order to form an initial set of tokens for that compression method. The text below therefore gives examples for referencing both the table subset and the string subset of the dictionary state item.

As defined in [section 3.3.3](#) in the Signaling Compression specification [1], a SigComp state is characterized by a certain set of information. For the static SIP/SDP dictionary, the information in the following Table 1 fully characterizes the state item.

Note that the string subset of the dictionary can be accessed using:

```
STATE-ACCESS (%ps, 6, 0, 0x0F0F, %sa, 0),
```

and the table subset can be accessed using:

```
STATE-ACCESS (%ps, 6, 0x0F0F, 0x0758, %sa, 0),
```

where %ps points to UDVM memory containing

```
0x743d3709dde9
```

and %sa is the desired destination address in UDVM memory (with UDVM byte copying rules applied).

Name:	Value:
=====	=====
state_identifier	0x743d3709dde947630e70ff26b5afcb2a11bf5255
state_length	0x1667
state_address	0 (not relevant for the dictionary)
state_instruction	0 (not relevant for the dictionary)
minimum_access_length	6

state_value

Representation of the table below.

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0000	766f	6963	652d	6d61	696c	0d0a	5265	6a65	voice-mail..Reje
0010	6374	2d43	6f6e	7461	6374	3a20	0d0a	4163	ct-Contact: ..Ac
0020	6365	7074	2d43	6f6e	7461	6374	3a20	0d0a	cept-Contact: ..
0030	4f72	6761	6e69	7a61	7469	6f6e	3a20	0d0a	Organization: ..
0040	4d49	4d45	2d56	6572	7369	6f6e	3a20	0d0a	MIME-Version: ..
0050	4572	726f	722d	496e	666f	3a20	0d0a	5469	Error-Info: ..Ti
0060	6d65	7374	616d	703a	200d	0a43	616c	6c2d	mestamp: ..Call-
0070	496e	666f	3a20	0d0a	5265	706c	792d	546f	Info: ..Reply-To
0080	3a20	0d0a	5375	626a	6563	743a	200d	0a57	: ..Subject: ..W
0090	6172	6e69	6e67	3a20	3b6d	6f62	696c	6974	arning: ;mobilit
00A0	793d	3b6c	616e	6775	6167	653d	3b70	7269	y=;language=;pri
00B0	6f72	6974	793d	3b68	616e	646c	696e	673d	ority=;handling=
00C0	3b66	6561	7475	7265	3d3b	7075	7270	6f73	;feature=;purpos
00D0	653d	3b6d	6574	686f	6473	3d3b	7363	6865	e=;methods=;sche
00E0	6d65	3d3b	6475	706c	6578	3d3b	6d65	6469	me=;duplex=;medi
00F0	613d	3b63	6c61	7373	3d3b	6361	7573	653d	a=;class=;cause=
0100	3b6f	6e6c	793d	6d6f	6269	6c65	3b74	6578	;only=mobile;tex
0110	743d	6669	7865	6469	6d61	6765	6675	6c6c	t=fixedimagefull
0120	6361	7264	3439	3420	5365	6375	7269	7479	card494 Security
0130	2041	6772	6565	6d65	6e74	2052	6571	7569	Agreement Requi
0140	7265	6465	7363	7269	7074	696f	6e6f	2d63	redescriptiono-c
0150	616e	6365	6c34	3834	2041	6464	7265	7373	ancel484 Address
0160	2049	6e63	6f6d	706c	6574	656c	6570	686f	Incompletelepho
0170	6e65	2d65	7665	6e74	7334	3831	2043	616c	ne-events481 Cal
0180	6c2f	5472	616e	7361	6374	696f	6e20	446f	l/Transaction Do
0190	6573	204e	6f74	2045	7869	7374	616c	653d	es Not Existale=
01A0	3430	3720	5072	6f78	7920	4175	7468	656e	407 Proxy Authen
01B0	7469	6361	7469	6f6e	2052	6571	7569	7265	tication Require
01C0	6469	7265	6374	3530	3020	5365	7276	6572	direct500 Server
01D0	2049	6e74	6572	6e61	6c20	4572	726f	726f	Internal Erroro
01E0	6275	7374	2d73	6f72	7469	6e67	3d36	3034	bust-sorting=604
01F0	2044	6f65	7320	4e6f	7420	4578	6973	7420	Does Not Exist
0200	416e	7977	6865	7265	6365	6976	652d	6f6e	Anywherereceive-on
0210	6c79	3431	3420	5265	7175	6573	742d	5552	ly414 Request-UR
0220	4920	546f	6f20	4c6f	6e67	6976	6575	7061	I Too Longiveupa
0230	7261	6c6c	656c	3138	3120	4361	6c6c	2049	rallel181 Call I
0240	7320	4265	696e	6720	466f	7277	6172	6465	s Being Forwarde
0250	6465	6163	7469	7661	7465	6434	3837	2052	deactivated487 R
0260	6571	7565	7374	2054	6572	6d69	6e61	7465	equest Terminate
0270	6469	6765	7374	2d69	6e74	6567	7269	7479	digest-integrity
0280	3431	3620	556e	7375	7070	6f72	7465	6420	416 Unsupported
0290	5552	4920	5363	6865	6d65	7267	656e	6379	URI Schemergency
02A0	3431	3520	556e	7375	7070	6f72	7465	6420	415 Unsupported
02B0	4d65	6469	6120	5479	7065	7273	6f6e	616c	Media Typersonal
02C0	3330	3020	4d75	6c74	6970	6c65	2043	686f	300 Multiple Cho
02D0	6963	6573	6d69	6d65	7373	6167	6534	3838	icesmimessage488
02E0	204e	6f74	2041	6363	6570	7461	626c	6520	Not Acceptable
02F0	4865	7265	706c	6163	6573	3432	3320	496e	Hereplaces423 In
0300	7465	7276	616c	2054	6f6f	2042	7269	6566	terval Too Brief

0310 726f 6d2d 7461 670d 0a61 3d6f 7269 656e rom-tag..a=orien
0320 743a 6c61 6e64 7363 6170 656e 6469 6e67 t:landscapending

0330	0d0a	613d	6b65	792d	6d67	6d74	3a4d	494b	..a=key-mgmt:MIK
0340	4559	3438	3320	546f	6f20	4d61	6e79	2048	EY483 Too Many H
0350	6f70	7363	7470	726f	7879	4f50	5449	4f4e	opsctproxyOPTION
0360	5320	0d0a	5265	7175	6573	742d	4469	7370	S ..Request-Disp
0370	6f73	6974	696f	6e3a	204e	6f76	200d	0a43	osition: Nov ..C
0380	6f6e	7465	6e74	2d44	6973	706f	7369	7469	ontent-Dispositi
0390	6f6e	3a20	4a75	6c20	0d0a	4175	7468	656e	on: Jul ..Authen
03A0	7469	6361	7469	6f6e	2d49	6e66	6f3a	204a	tication-Info: J
03B0	756e	200d	0a50	726f	7879	2d41	7574	686f	un ..Proxy-Autho
03C0	7269	7a61	7469	6f6e	3a20	5365	7020	3430	rization: Sep 40
03D0	3320	466f	7262	6964	6465	6e6f	7265	736f	3 Forbiddenreso
03E0	7572	6365	3430	3820	5265	7175	6573	7420	urce408 Request
03F0	5469	6d65	6f75	746f	6e65	3338	3020	416c	Timeoutone380 Al
0400	7465	726e	6174	6976	6520	5365	7276	6963	ternative Servic
0410	6535	3033	2053	6572	7669	6365	2055	6e61	e503 Service Una
0420	7661	696c	6162	6c65	0d0a	5072	6f78	792d	vailable..Proxy-
0430	4175	7468	656e	7469	6361	7465	3a20	4170	Authenticate: Ap
0440	7220	3432	3120	4578	7465	6e73	696f	6e20	r 421 Extension
0450	5265	7175	6972	6564	3430	3520	4d65	7468	Required405 Meth
0460	6f64	204e	6f74	2041	6c6c	6f77	6564	6175	od Not Allowedau
0470	7468	2d69	6e74	6572	6c65	6176	696e	673d	th-interleaving=
0480	3330	3220	4d6f	7665	6420	5465	6d70	6f72	302 Moved Tempor
0490	6172	696c	7933	3031	204d	6f76	6564	2050	arily301 Moved P
04A0	6572	6d61	6e65	6e74	6c79	0d0a	436f	6e74	ermanently..Cont
04B0	656e	742d	4c61	6e67	7561	6765	3a20	4665	ent-Language: Fe
04C0	6220	0d0a	436f	6e74	656e	742d	456e	636f	b ..Content-Enco
04D0	6469	6e67	3a20	4a61	6e20	3638	3720	4469	ding: Jan 687 Di
04E0	616c	6f67	2054	6572	6d69	6e61	7465	6435	alog Terminated5
04F0	3133	204d	6573	7361	6765	2054	6f6f	204c	13 Message Too L
0500	6172	6765	0d0a	613d	6f72	6965	6e74	3a70	arge..a=orient:p
0510	6f72	7472	6169	746f	2d74	6167	3430	3220	ortrait-to-tag402
0520	5061	796d	656e	7420	5265	7175	6972	6564	Payment Required
0530	3439	3120	5265	7175	6573	7420	5065	6e64	491 Request Pend
0540	696e	6735	3031	204e	6f74	2049	6d70	6c65	ing501 Not Imple
0550	6d65	6e74	6564	3430	3620	4e6f	7420	4163	mented406 Not Ac
0560	6365	7074	6162	6c65	3439	3320	556e	6465	ceptable493 Unde
0570	6369	7068	6572	6162	6c65	0d0a	613d	7479	cipherable..a=ty
0580	7065	3a62	726f	6164	6361	7374	7275	6536	pe:broadcasttrue6
0590	3036	204e	6f74	2041	6363	6570	7461	626c	06 Not Acceptabl
05A0	6534	3832	204c	6f6f	7020	4465	7465	6374	e482 Loop Detect
05B0	6564	6d6f	6465	2d63	6861	6e67	652d	6e65	edmode-change-ne
05C0	6967	6862	6f72	3d0d	0a6d	3d61	7070	6c69	ighbor=..m=appli
05D0	6361	7469	6f6e	2035	3032	2042	6164	2047	cation 502 Bad G
05E0	6174	6577	6179	0d0a	4163	6365	7074	2d45	ateway..Accept-E
05F0	6e63	6f64	696e	673a	200d	0a41	6363	6570	ncoding: ..Accep
0600	742d	4c61	6e67	7561	6765	3a20	0d0a	613d	t-Language: ..a=
0610	6f72	6965	6e74	3a73	6561	7363	6170	656d	orient:seascapem
0620	6f64	652d	6368	616e	6765	2d70	6572	696f	ode-change-perio
0630	643d	756e	6b6e	6f77	6e6f	2d66	6f72	6b62	d=unknowno-forkb

0640 7573 696e 6573 7369 7066 7261 670d 0a61 usinessipfrag..a
0650 3d74 7970 653a 6d6f 6465 7261 7465 6434 =type:moderated4

0660	3034	204e	6f74	2046	6f75	6e64	3330	3520	04 Not Found305
0670	5573	6520	5072	6f78	790d	0a61	3d74	7970	Use Proxy..a=typ
0680	653a	7265	6376	6f6e	6c79	0d0a	5072	6f78	e:recvonly..Prox
0690	792d	5265	7175	6972	653a	2061	7474	656e	y-Require: atten
06A0	6461	6e74	696d	656f	7574	0d0a	613d	7479	dantimeout..a=ty
06B0	7065	3a74	6573	746c	730d	0a61	3d74	7970	pe:testls..a=typ
06C0	653a	6d65	6574	696e	670d	0a6b	3d70	726f	e:meeting..k=pro
06D0	6d70	743a	4d45	5353	4147	4520	0d0a	4d69	mpt:MESSAGE ..Mi
06E0	6e2d	4578	7069	7265	733a	200d	0a52	6574	n-Expires: ..Ret
06F0	7279	2d41	6674	6572	3a20	0d0a	556e	7375	ry-After: ..Unsu
0700	7070	6f72	7465	643a	200d	0a49	6e2d	5265	pported: ..In-Re
0710	706c	792d	546f	3a20	3138	3220	5175	6575	ply-To: 182 Queu
0720	6564	0d0a	416c	6572	742d	496e	666f	3a20	ed..Alert-Info:
0730	0d0a	613d	6672	616d	6572	6174	653a	0d0a	..a=framerate:..
0740	5573	6572	2d41	6765	6e74	3a20	4341	4e43	User-Agent: CANC
0750	454c	200d	0a61	3d6d	6178	7074	696d	653a	EL ..a=maxptime:
0760	3b72	6574	7279	2d61	6674	6572	3d34	3130	;retry-after=410
0770	2047	6f6e	6575	6163	6861	6e6e	656c	733d	Goneuachannels=
0780	0d0a	5072	696f	7269	7479	3a20	0d0a	613d	..Priority: ..a=
0790	7175	616c	6974	793a	0d0a	6d3d	636f	6e74	quality:..m=cont
07A0	726f	6c20	0d0a	613d	7364	706c	616e	673a	rol ..a=sdplang:
07B0	0d0a	613d	6368	6172	7365	743a	0d0a	5265	..a=charset:..Re
07C0	706c	6163	6573	3a20	0d0a	5265	6665	722d	places: ..Refer-
07D0	546f	3a20	5245	4645	5220	6970	7365	632d	To: REFER ipsec-
07E0	696b	650d	0a6b	3d62	6173	6536	343a	3b72	ike..k=base64;;r
07F0	6566	7265	7368	6572	3d0d	0a61	3d6b	6579	efresher=..a=key
0800	7764	733a	3b74	7261	6e73	706f	7274	3d0d	wds;;transport=.
0810	0a61	3d67	726f	7570	3a0d	0a61	3d70	7469	.a=group:..a=pti
0820	6d65	3a0d	0a6b	3d63	6c65	6172	3a3b	7265	me:..k=clear;;re
0830	6365	6976	6564	3d3b	6475	7261	7469	6f6e	ceived=;duration
0840	3d0d	0a53	6572	7665	723a	200d	0a41	6363	=..Server: ..Acc
0850	6570	743a	200d	0a4d	696e	2d53	453a	2049	ept: ..Min-SE: I
0860	4e46	4f20	0d0a	6d3d	6461	7461	206d	756c	NFO ..m=data mul
0870	7469	7061	7274	6d6f	6465	2d73	6574	3d0d	tipartmode-set=.
0880	0a61	3d74	6f6f	6c3a	0d0a	613d	6c61	6e67	.a=tool:..a=lang
0890	3a54	4c53	756e	2c20	0d0a	613d	6d69	643a	:TLSun, ..a=mid:
08A0	0d0a	6b3d	7572	693a	6372	6974	6963	616c	..k=uri:critical
08B0	0d0a	4461	7465	3a20	3b6d	6574	686f	643d	..Date: ;method=
08C0	0d0a	613d	6361	743a	3b72	6561	736f	6e3d	..a=cat;;reason=
08D0	3b6d	6164	6472	3d6f	7061	7175	653d	3b61	;maddr=opaque;a
08E0	6c67	3d54	7565	2c20	4d6f	6e2c	203b	7474	lg=Tue, Mon, ;tt
08F0	6c3d	5361	742c	2057	6564	2c20	4672	692c	l=Sat, Wed, Fri,
0900	2061	7574	733d	0d0a	693d	0d0a	7a3d	3b69	auts=..i=..z=;i
0910	643d	6372	633d	0d0a	723d	0d0a	653d	0d0a	d=crc=..r=..e=.
0920	753d	7561	733b	713d	3630	3020	4275	7379	u=uas;q=600 Busy
0930	2045	7665	7279	7768	6572	656a	6563	7465	Everywherejecte
0940	6434	3830	2054	656d	706f	7261	7269	6c79	d480 Temporarily
0950	2055	6e61	7661	696c	6162	6c65	0d0a	613d	Unavailable..a=
0960	7479	7065	3a48	2e33	3332	3032	2041	6363	type:H.33202 Acc

0970 6570 7465 640d 0a53 6573 7369 6f6e 2d45 epted..Session-E
0980 7870 6972 6573 3a20 474d 5468 752c 200d xpires: GMThu, .

0990	0a50	2d41	7373	6572	7465	642d	4964	656e	.P-Asserted-Iden
09A0	7469	7479	3a20	4175	6720	0d0a	4d65	6469	tity: Aug ..Medi
09B0	612d	4175	7468	6f72	697a	6174	696f	6e3a	a-Authorization:
09C0	204f	6374	200d	0a53	7562	7363	7269	7074	Oct ..Subscript
09D0	696f	6e2d	5374	6174	653a	204d	6179	200d	ion-State: May .
09E0	0a41	7373	6572	7465	642d	4964	656e	7469	.Asserted-Identi
09F0	7479	3a20	4d61	7220	3438	3620	4275	7379	ty: Mar 486 Busy
0A00	2048	6572	6571	7569	7265	6434	3030	2042	Herequired400 B
0A10	6164	2052	6571	7565	7374	656c	3a0d	0a61	ad Requestel:...a
0A20	3d69	6e61	6374	6976	6552	5450	2f53	4156	=inactiveRTP/SAV
0A30	5020	5254	502f	4156	5046	2075	6470	0d0a	P RTP/AVPF udp..
0A40	5265	636f	7264	2d52	6f75	7465	3a20	0d0a	Record-Route: ..
0A50	416c	6c6f	772d	4576	656e	7473	3a20	0d0a	Allow-Events: ..
0A60	613d	7265	6376	6f6e	6c79	0d0a	4576	656e	a=recvonly..Even
0A70	743a	2020	2020	0d0a	613d	7365	6e64	6f6e	t: ...a=sendon
0A80	6c79	0d0a	633d	494e	2049	5034	200d	0a52	ly..c=IN IP4 ..R
0A90	6561	736f	6e3a	200d	0a41	6c6c	6f77	3a20	reason: ..Allow:
0AA0	0d0a	5061	7468	3a20	3b75	7365	723d	0d0a	..Path: ;user=..
0AB0	623d	4153	2043	5420	0d0a	5757	572d	4175	b=AS CT ..WWW-Au
0AC0	7468	656e	7469	6361	7465	3a20	4469	6765	thenticate: Dige
0AD0	7374	2034	3230	2042	6164	2045	7874	656e	st 420 Bad Exten
0AE0	7369	6f6e	6f6e	2d72	6563	7572	7365	6e64	sionon-recursend
0AF0	2d6f	6e6c	790d	0a61	3d73	656e	6472	6563	-only..a=sendrec
0B00	7669	6465	6f63	7465	742d	616c	6967	6e3d	videoctet-align=
0B10	3438	3920	4261	6420	4576	656e	7463	7072	489 Bad Eventcpr
0B20	6563	6f6e	6469	7469	6f6e	6f6e	2d75	7267	econditionon-urg
0B30	656e	7461	7070	6c69	6361	7469	6f6e	2f73	entapplication/s
0B40	6470	6174	6865	6164	6572	7370	6175	7468	dpatheaderspauth
0B50	3d51	2e38	3530	3520	5665	7273	696f	6e20	=Q.8505 Version
0B60	4e6f	7420	5375	7070	6f72	7465	646f	6d61	Not Supportedoma
0B70	696e	3d35	3034	2053	6572	7665	7220	5469	in=504 Server Ti
0B80	6d65	2d6f	7574	696d	6572	656e	6465	7265	me-outimerendere
0B90	616c	6d3d	4d44	3538	3020	5072	6563	6f6e	alm=MD580 Precon
0BA0	6469	7469	6f6e	2046	6169	6c75	7265	7370	dition Failuresp
0BB0	6f6e	7365	3d53	5542	5343	5249	4245	2034	onse=SUBSCRIBE 4
0BC0	3232	2053	6573	7369	6f6e	2054	696d	6572	22 Session Timer
0BD0	2054	6f6f	2053	6d61	6c6c	6f63	616c	6970	Too Smallocalip
0BE0	7365	632d	6d61	6e64	6174	6f72	7934	3133	sec-mandatory413
0BF0	2052	6571	7565	7374	2045	6e74	6974	7920	Request Entity
0C00	546f	6f20	4c61	7267	6532	6541	4b41	7631	Too Large2eAKAv1
0C10	2d4d	4435	2d73	6573	7369	6f6e	6f72	6d61	-MD5-sessionorma
0C20	6c0d	0a0d	0a50	2d4d	6564	6961	2d41	7574	l...P-Media-Aut
0C30	686f	7269	7a61	7469	6f6e	3a20	4465	6320	horization: Dec
0C40	3630	3320	4465	636c	696e	6578	746e	6f6e	603 Declinextnon
0C50	6365	3d34	3835	2041	6d62	6967	756f	7573	ce=485 Ambiguous
0C60	6572	6e61	6d65	3d31	3833	2053	6573	7369	ername=183 Sessi
0C70	6f6e	2050	726f	6772	6573	7369	7073	3a68	on Progressips:h
0C80	616c	6661	696c	7572	656d	6f74	6572	6d69	alfailuremotermi
0C90	6e61	7465	6466	616c	7365	7175	656e	7469	natedfalsequenti

0CA0 616c 676f 7269 7468 6d3d 3430 3120 556e algorithm=401 Un
0CB0 6175 7468 6f72 697a 6564 5343 5450 5241 authorizedSCTPRA

0CC0	434b	200d	0a53	6563	7572	6974	792d	436c	CK ..Security-C1
0CD0	6965	6e74	3a20	0d0a	5365	6375	7269	7479	ient: ..Security
0CE0	2d53	6572	7665	723a	200d	0a53	6563	7572	-Server: ..Secur
0CF0	6974	792d	5665	7269	6679	3a20	6175	6469	ity-Verify: audi
0D00	6f70	7469	6f6e	616c	6572	740d	0a74	3d30	optionalert..t=0
0D10	2030	2e30	2e30	2e30	0d0a	436f	6e74	656e	0.0.0.0..Conten
0D20	742d	4c65	6e67	7468	3a20	696e	666f	5245	t-Length: inforE
0D30	4749	5354	4552	200d	0a41	7574	686f	7269	GISTER ..Authori
0D40	7a61	7469	6f6e	3a20	3b6c	7265	6665	720d	zation: ;lrefer.
0D50	0a43	6f6e	7465	6e74	2d54	7970	653a	2031	.Content-Type: 1
0D60	3830	2052	696e	6769	6e67	0d0a	633d	494e	80 Ringing..c=IN
0D70	2049	5036	2031	3030	2054	7279	696e	6776	IP6 100 Tryingv
0D80	3d30	0d0a	6f3d	4e4f	5449	4659	2055	5044	=0..o=NOTIFY UPD
0D90	4154	4520	0d0a	5375	7070	6f72	7465	643a	ATE ..Supported:
0DA0	2041	4d52	5450	2f41	5650	200d	0a61	3d72	AMRTP/AVP ..a=r
0DB0	7470	6d61	703a	0d0a	5072	6976	6163	793a	tpmap:..Privacy:
0DC0	200d	0a45	7870	6972	6573	3a20	0d0a	5265	..Expires: ..Re
0DD0	7175	6972	653a	200d	0a6d	3d61	7564	696f	quire: ..m=audio
0DE0	200d	0a6d	3d76	6964	656f	200d	0a73	3d20	..m=video ..s=
0DF0	0d0a	613d	666d	7470	3a3b	6578	7069	7265	..a=fmtp:;expire
0E00	733d	0d0a	613d	6375	7272	3a0d	0a61	3d63	s=..a=curr:..a=c
0E10	6f6e	663a	0d0a	526f	7574	653a	2069	636f	onf:..Route: ico
0E20	6e6f	6e65	0d0a	613d	6465	733a	0d0a	5253	none..a=des:..RS
0E30	6571	3a20	0d0a	5241	636b	3a20	4259	4520	eq: ..RAck: BYE
0E40	636e	6f6e	6365	3d31	3030	7265	6c71	6f70	cnonce=100relqop
0E50	3d75	7269	3d6e	633d	716f	7354	4350	5544	=uri=nc=qosTCPUD
0E60	5078	6d6c	0d0a	5669	613a	2053	4950	2f32	Pxml..Via: SIP/2
0E70	2e30	2f54	4350	203b	636f	6d70	3d73	6967	.0/TCP ;comp=sig
0E80	636f	6d70	726f	6261	7469	6f6e	6f2d	7175	comprobationo-qu
0E90	6575	650d	0a56	6961	3a20	5349	502f	322e	eue..Via: SIP/2.
0EA0	302f	5544	5020	3b62	7261	6e63	683d	7a39	0/UDP ;branch=z9
0EB0	6847	3462	4b0d	0a4d	6178	2d46	6f72	7761	hG4bK..Max-Forwa
0EC0	7264	733a	2049	4e56	4954	4520	416e	6f6e	rds: INVITE Anon
0ED0	796d	6f75	7369	703a	0d0a	436f	6e74	6163	ymousip:..Contac
0EE0	743a	200d	0a43	616c	6c2d	4944	3a20	3230	t: ..Call-ID: 20
0EF0	3020	4f4b	0d0a	4353	6571	3a20	0d0a	4672	0 OK..CSeq: ..Fr
0F00	6f6d	3a20	0d0a	546f	3a20	3b74	6167	3d0e	om: ..To: ;tag=.
0F10	d400	040e	b500	100f	0400	060e	6b00	070e	k...
0F20	9a00	0c0e	6400	070e	c500	060e	c500	070e	d.....
0F30	9300	130e	d800	0b0e	e300	0b0e	f400	080e	.....
0F40	fc00	080f	0a00	050e	a600	0f0e	7700	0d0e	w...
0F50	ee00	060e	4000	070e	3c00	030e	3c00	040d	@...<...<...
0F60	9400	0d07	a800	030d	2e00	080d	2e00	090d	.....
0F70	0000	080b	b500	090b	b500	0a0d	8600	060d	.....
0F80	8600	070c	bd00	050c	bd00	060d	8d00	060d	.....
0F90	8d00	070c	a000	0a0e	5500	030b	9400	030a	U.....
0FA0	b800	140a	b800	1b0c	2100	040c	1100	080c	!.....
0FB0	5e00	090e	3400	080e	6100	030d	3700	1105	^...4...a...7...
0FC0	cb00	0b0c	0b00	040c	0b00	090e	5100	040d	Q...

0FD0 1800 120d 4f00 100d b600 0b0b 3300 0f0e0.....3...
0FE0 4d00 040d c100 0b0e 4700 060d f900 090b M.....G.....

0FF0	ac00	090c	4900	0a0b	4900	080b	8e00	060b	I...I.....
1000	6c00	070d	cc00	0b0c	4d00	060e	1400	090e	l.....M.....
1010	2c00	080c	c300	130c	d600	130c	e900	130b	,.....
1020	1e00	0c0d	4800	030c	bf00	030e	5e00	030e	H.....^...
1030	5b00	030c	bf00	040e	2000	040d	7500	0a0d	[.....u...
1040	5f00	0b0c	6700	140a	cc00	070c	aa00	100d	_....g.....
1050	7f00	070d	eb00	040d	eb00	050d	6a00	0b0d	j...
1060	0b00	040d	0b00	070d	ab00	0b0d	f000	090e	.....
1070	0200	090e	2400	080e	0b00	090d	d700	0a0d	\$.....
1080	e100	0a0d	a300	080e	5800	030b	e400	090d	X.....
1090	0000	080e	2000	040c	0800	030b	d900	050c	.....
10A0	8700	060a	7a00	0406	8200	040a	f900	080d	Z.....
10B0	a100	030e	cc00	090a	9700	090a	4e00	100a	N...
10C0	a800	060a	8200	0b01	6d00	050a	ae00	040a	m.....
10D0	6a00	0c09	8f00	1709	df00	150a	5e00	0c0a	j.....^...
10E0	f500	0c0a	7600	0c0a	1d00	0c09	7500	130a	v.....u...
10F0	a000	080b	4100	0409	aa00	170c	2300	190a	A.....#...
1100	8d00	0a0a	b200	030a	b500	030a	3e00	100a	>...
1110	2900	090a	3200	090c	7a00	0503	d600	020a	)...2...z.....
1120	1900	040e	6b00	0c0d	4a00	0509	c500	1609	k...J.....
1130	6900	0c0e	6400	1309	4100	1b09	f800	0d09	i...d...A.....
1140	2800	1305	8b00	040c	9500	0504	6e00	0404	(.....n...
1150	6e00	0809	0100	0502	7000	1007	da00	090b	n.....p.....
1160	de00	0902	d300	0508	de00	0506	a300	0702	.....
1170	2900	0603	da00	0a09	0e00	0405	1600	0603	).....
1180	0f00	0802	f200	0807	7500	0309	2200	030b	u..."...
1190	8500	0502	d600	0706	4600	0306	4600	0708	F...F...
11A0	6d00	0908	e800	0508	e300	0508	f700	0509	m.....
11B0	8a00	0508	fc00	0508	f200	0508	9300	0504	.....
11C0	d500	0504	bd00	0509	f300	0504	3d00	0509	=...
11D0	da00	0503	ae00	0503	9300	0509	a500	0503	.....
11E0	c900	0509	c000	0503	7800	050c	3b00	0509	X...;...
11F0	8700	0403	5a00	0702	9700	090b	2d00	060c	Z.....-...
1200	1b00	060b	2900	0a08	3700	0a08	d000	0708	)...7.....
1210	2d00	0a03	5a00	0807	4c00	0607	ee00	0b07	-...Z...L.....
1220	4c00	0708	5f00	0409	2500	0308	5f00	050b	L..._...%..._...
1230	4400	060a	a900	0407	d400	0508	a800	0807	D.....
1240	d400	0606	d400	0706	d400	0802	3600	1b07	6...
1250	1800	0a08	4b00	0a08	9100	0305	e600	1302	K.....
1260	c000	1404	9500	1504	8000	1506	6c00	0d03	l...
1270	fa00	170a	0b00	0f05	f900	1305	1c00	1403	.....
1280	ce00	0d06	5f00	0d04	5800	1605	5600	1201	_...X...V...
1290	a000	2103	e400	1307	6d00	080b	ed00	1c02	..!.....m.....
12A0	1200	1802	a000	1a02	8000	1a0a	d300	1104	.....
12B0	4200	160b	bf00	1b02	fa00	1607	2200	0e01	B....."...
12C0	7900	2305	a100	1103	4200	1101	5500	160c	y.#.....B...U...
12D0	5300	0d03	9800	1702	5b00	1602	dd00	170b	S.....[.....
12E0	1000	0d05	3000	1305	6800	1201	2400	1f01	0...h...\$...
12F0	c600	1905	4300	1305	d700	0f04	1100	170b	C.....

1300 7300 130b 5400 1904 ef00 150b 9600 180c s...T.....
1310 ba00 040c 4000 0b01 ed00 1b05 8f00 1204@.....

```

1320 da00 1503 7d00 1704 c200 1404 aa00 1408 ....}.
1330 b000 0809 0600 0409 1e00 0409 1a00 040a .....
1340 2300 0607 0900 0f06 dc00 0f08 5500 0a03 #.....U...
1350 2900 0709 1600 0409 0a00 0408 2300 0a07 ).....#...
1360 e300 0b08 a000 0806 c900 0b08 c000 0807 .....
1370 f900 0b08 7f00 0908 1900 0a07 5300 0d0c .....S...
1380 8b00 0a07 8000 0c04 2800 1603 b300 1706 .....(.....
1390 8a00 1105 0400 1303 1700 1406 0c00 1305 .....
13A0 7a00 1206 b900 1006 4d00 1206 aa00 0d09 z.....M.....
13B0 5c00 0e06 7900 1107 b000 0c07 a400 0c08 \...y.....
13C0 8800 0907 3000 0e07 8c00 0c07 c800 0c08 ....0.....
13D0 c800 0807 bc00 0c07 6000 0d08 9800 0808 .....`.....
13E0 0f00 0a03 3000 1203 3000 0d03 6200 1706 ....0...0...b...
13F0 eb00 0f05 c700 1008 6400 0907 9800 0c08 .....d.....
1400 4100 0a02 5000 0b0e 8300 0906 fa00 0f07 A...P.....
1410 3e00 0e0a 3b00 030d 1100 0709 3900 0808 >...;.....9...
1420 0400 0b0a 3b00 030b 1c00 030c 8200 0706 ....;.....
1430 3200 0703 5200 0406 b600 0301 4700 0208 2...R.....G...
1440 b800 0808 ed00 0508 d700 0701 9a00 060b .....
1450 0400 0c08 7600 0906 1f00 1305 b200 1509 ....v.....
1460 1200 0401 de00 0f04 7300 0d07 7700 090b .....s...w...
1470 0400 0b01 6900 0f01 7300 0606 5a00 0403 ....i...s...Z...
1480 f600 0401 0000 0601 2400 0400 1c00 1201 .....$.
1490 c600 0403 5500 0505 4300 0401 be00 0805 ....U...C.....
14A0 d700 0401 4f00 0604 1100 0401 4c00 090b ....O.....L...
14B0 7300 0406 3b00 040b 5400 0406 3800 0704 s...;...T...8...
14C0 ef00 040a e700 070b 9600 040a e300 0b09 .....
14D0 2800 0402 2e00 080c 4000 040c 9800 0a01 (.....@.....
14E0 ed00 040e 8e00 0505 8f00 040e 8b00 0804 .....
14F0 da00 0400 6900 0d00 4e00 0e00 3e00 1000 ....i...N...>...
1500 2e00 1000 0a00 1200 7600 0c0d 7500 0400 .....v...u...
1510 8200 0b0d 5f00 0400 5c00 0d0a 8200 0402 ...._...\.....
1520 3600 0400 8d00 0b07 1800 0400 c900 090c 6.....
1530 6700 040e 1d00 040e ee00 040d 2a00 0409 g.....*...
1540 6900 0406 c900 0401 2000 0402 c000 040b i.....
1550 8900 0604 9500 040c 1500 0704 8000 040d .....
1560 0600 0506 6c00 0400 b600 0a03 fa00 040a ....l.....
1570 0300 080a 0b00 0401 0d00 040c aa00 0401 .....
1580 1700 0505 1c00 040c fc00 0503 ce00 040b .....
1590 0000 0506 5f00 040e a600 0804 5800 040e ...._.....X...
15A0 6b00 0305 5600 040b 5100 0501 a000 0400 k...V...Q.....
15B0 f900 0703 e400 0401 0c00 0607 6d00 0400 .....m...
15C0 f200 070b ed00 0403 1700 0400 e300 0802 .....
15D0 1200 0400 c000 0902 a000 0400 a200 0a05 .....
15E0 c700 0402 8000 0400 eb00 070a d300 0400 .....
15F0 9800 0a04 4200 0401 1200 050b bf00 0401 ....B.....
1600 0600 0602 fa00 0402 b800 0809 4100 0406 .....A...
1610 3f00 0801 7900 0401 1c00 0405 a100 040c ?...y.....
1620 7f00 0403 4200 0402 0600 0c01 5500 040a ....B.....U...

```

1630 ec00 090c 5300 0400 0000 0a09 f800 0406S.....
1640 9b00 0902 5b00 0400 ac00 0a02 dd00 0401[.....


```
1650  4200 0b0b 1000 0400 d200 0905 3000 0400  B.....0...
1660  db00 0805 6800 04                          ....h..
```

Table 1: binary representation of the static SIP/SDP
dictionary for SigComp

4. Security Considerations

The security considerations of [1] apply. This memo does not introduce any known additional security risk.

5. IANA Considerations

None.

6. Authors' Addresses

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8. References

8.1 Normative references

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Appendix A. SIP input strings to the SIP/SDP static dictionary

For reference, this section lists the SIP input strings that were used in generating the dictionary, as well as a priority value, the offset of the string in the generated dictionary, the length of the string, and one or more references into the referenced documents that motivate the presence of this string. Note that the notation "[CRLF]" stands for a sequence of two bytes with the values 0x0d and 0x0a, respectively.

The priority value is used for determining the position of the string in the dictionary. Lower priority values (higher priorities) cause the string to occur at a later position in the dictionary, making it more efficient to reference the string in certain compression algorithms. Hence, small priority values were assigned to strings more likely to occur.

String	Pr	Off	Len	References
=====	==	====	====	=====
"sip:"	1	0ED4	0004	[2] 19.1.1
"sips:"	3	0C7A	0005	[2] 19.1.1
"tel:"	3	0A19	0004	[6] 2.2
"SIP/2.0"	1	0E6B	0007	[2] 25.1
"SIP/2.0/UDP "	1	0E9A	000C	[2] 25.1
"SIP/2.0/TCP "	3	0E6B	000C	[2] 25.1
"INVITE"	1	0EC5	0006	[2] 25.1
"INVITE "	1	0EC5	0007	[2] 25.1
"ACK"	2	0CBF	0003	[2] 25.1
"ACK "	2	0CBF	0004	[2] 25.1
"OPTIONS"	4	035A	0007	[2] 25.1
"OPTIONS "	4	035A	0008	[2] 25.1
"BYE"	2	0E3C	0003	[2] 25.1
"BYE "	2	0E3C	0004	[2] 25.1
"CANCEL"	4	074C	0006	[2] 25.1
"CANCEL "	4	074C	0007	[2] 25.1
"REGISTER"	2	0D2E	0008	[2] 25.1
"REGISTER "	2	0D2E	0009	[2] 25.1
"INFO"	4	085F	0004	[7] 2
"INFO "	4	085F	0005	[7] 2
"SUBSCRIBE"	2	0BB5	0009	[8] 8.1.1
"SUBSCRIBE "	2	0BB5	000A	[8] 8.1.1
"NOTIFY"	2	0D86	0006	[8] 8.1.2
"NOTIFY "	2	0D86	0007	[8] 8.1.2
"PRACK"	2	0CBD	0005	[9] 6
"PRACK "	2	0CBD	0006	[9] 6
"UPDATE"	2	0D8D	0006	[10] 7, 10
"UPDATE "	2	0D8D	0007	[10] 7, 10
"REFER"	4	07D4	0005	[12] 3, 10
"REFER "	4	07D4	0006	[12] 3, 10

"MESSAGE"
"MESSAGE "

4 06D4 0007 [20] 9
4 06D4 0008 [20] 9

"[CRLF]Accept: "	4	084B	000A	[2]	20.1
"[CRLF]Accept-Contact: "	5	001C	0012	[22]	5
"[CRLF]Accept-Encoding: "	4	05E6	0013	[2]	20.2
"[CRLF]Accept-Language: "	4	05F9	0013	[2]	20.3
"[CRLF]Alert-Info: "	4	0722	000E	[2]	20.4
"[CRLF]Allow: "	3	0A97	0009	[2]	20.5
"[CRLF]Allow-Events: "	3	0A4E	0010	[8]	8.2.1
"[CRLF]Authentication-Info: "	4	0398	0017	[2]	20.6
"[CRLF]Authorization: "	2	0D37	0011	[2]	20.7
"[CRLF]Call-ID: "	1	0EE3	000B	[2]	20.8
"[CRLF]Call-Info: "	5	0069	000D	[2]	20.9
"[CRLF]Contact: "	1	0ED8	000B	[2]	20.10
"[CRLF]Content-Disposition: "	4	037D	0017	[2]	20.11
"[CRLF]Content-Encoding: "	4	04C2	0014	[2]	20.12
"[CRLF]Content-Language: "	4	04AA	0014	[2]	20.13
"[CRLF]Content-Length: "	2	0D18	0012	[2]	20.14
"[CRLF]Content-Type: "	2	0D4F	0010	[2]	20.15
"[CRLF]CSeq: "	1	0EF4	0008	[2]	20.16
"[CRLF]Date: "	4	08B0	0008	[2]	20.17
"[CRLF]Error-Info: "	5	004E	000E	[2]	20.18
"[CRLF]Event: "	3	0A6A	000C	[8]	8.2.1
"[CRLF]Expires: "	2	0DC1	000B	[2]	20.19
"[CRLF]From: "	1	0EFC	0008	[2]	20.20
"[CRLF]In-Reply-To: "	4	0709	000F	[2]	20.21
"[CRLF]Max-Forwards: "	1	0EB5	0010	[2]	20.22
"[CRLF]Min-Expires: "	4	06DC	000F	[2]	20.23
"[CRLF]Min-SE: "	4	0855	000A	[17]	5
"[CRLF]MIME-Version: "	5	003E	0010	[2]	20.24
"[CRLF]P-Asserted-Identity: "	3	098F	0017	[33]	13.1
"[CRLF]Asserted-Identity: "	3	09DF	0015	[33]	13.1
"[CRLF]Organization: "	5	002E	0010	[2]	20.25
"[CRLF]Path: "	3	0AA0	0008	[15]	3
"[CRLF]Priority: "	4	0780	000C	[2]	20.26
"[CRLF]Privacy: "	2	0DB6	000B	[34]	4.2
"[CRLF]Proxy-Authenticate: "	4	0428	0016	[2]	20.27
"[CRLF]Proxy-Authorization: "	4	03B3	0017	[2]	20.28
"[CRLF]Proxy-Require: "	4	068A	0011	[2]	20.29
"[CRLF]P-Media-Authorization: "	3	0C23	0019	[21]	5.1, 9
"[CRLF]Media-Authorization: "	3	09AA	0017	[21]	5.1, 9
"[CRLF]Rack: "	2	0E34	0008	[9]	7.2
"[CRLF]Reason: "	3	0A8D	000A	[16]	2
"[CRLF]Record-Route: "	3	0A3E	0010	[2]	20.30
"[CRLF]Refer-To: "	4	07C8	000C	[12]	3, 10
"[CRLF]Reject-Contact: "	5	000A	0012	[22]	5
"[CRLF]Replaces: "	4	07BC	000C	[13]	3.1
"[CRLF]Reply-To: "	5	0076	000C	[2]	20.31
"[CRLF]Request-Disposition: "	4	0362	0017	[22]	5
"[CRLF]Require: "	2	0DCC	000B	[2]	20.32
"[CRLF]Retry-After: "	4	06EB	000F	[2]	20.33

"[CRLF]Route: "
"[CRLF]RSeq: "

2 0E14 0009 [2] 20.34
2 0E2C 0008 [9] 7.1

"[CRLF]Security-Client: "	2	0CC3	0013	[19]	3.3
"[CRLF]Security-Server: "	2	0CD6	0013	[19]	3.3
"[CRLF]Security-Verify: "	2	0CE9	0013	[19]	3.3
"[CRLF]Server: "	4	0841	000A	[2]	20.35
"[CRLF]Session-Expires: "	3	0975	0013	[17]	4
"[CRLF]Subject: "	5	0082	000B	[2]	20.36
"[CRLF]Subscription-State: "	3	09C5	0016	[8]	8.2.3
"[CRLF]Supported: "	2	0D94	000D	[2]	20.37
"[CRLF]Timestamp: "	5	005C	000D	[2]	20.38
"[CRLF]To: "	1	0F04	0006	[2]	20.39
"[CRLF]Unsupported: "	4	06FA	000F	[2]	20.40
"[CRLF]User-Agent: "	4	073E	000E	[2]	20.41
"[CRLF]Via: "	1	0E64	0007	[2]	20.42
"[CRLF]Via: SIP/2.0/UDP "	1	0E93	0013	[2]	20.42
"[CRLF]Via: SIP/2.0/TCP "	3	0E64	0013	[2]	20.42
"[CRLF]Warning: "	5	008D	000B	[2]	20.43
"[CRLF]WWW-Authenticate: "	2	0AB8	0014	[2]	20.44
"[CRLF]WWW-Authenticate: Digest "	2	0AB8	001B	[2]	20.44
"[CRLF][CRLF]"	2	0C21	0004	[2]	7
";transport="	4	0804	000B	[2]	25.1
"udp"	4	0A3B	0003	[2]	25.1,
				[24]	A, [2] 25.1, [24] A
"tcp"	4	0B1C	0003	[2]	25.1
"sctp"	4	0352	0004	[2]	25.1
"tls"	4	06B6	0003	[2]	25.1,
				[19]	3.3
";user="	3	0AA8	0006	[2]	25.1
"phone"	3	016D	0005	[2]	25.1
"ip"	4	0147	0002	[2]	25.1
";method="	4	08B8	0008	[2]	25.1
";ttl="	4	08ED	0005	[2]	25.1
";lr"	2	0D48	0003	[2]	25.1
"Digest "	2	0ACC	0007	[5]	3.2.1,
					3.2.2
"username="	2	0C5E	0009	[5]	3.2.2
"uri="	2	0E51	0004	[5]	3.2.2
"qop="	2	0E4D	0004	[5]	3.2.1,
					3.2.2
"cnonce="	2	0E40	0007	[5]	3.2.2
"nc="	2	0E55	0003	[5]	3.2.2
"response="	2	0BAC	0009	[5]	3.2.2
"nextnonce="	2	0C49	000A	[5]	3.2.3
"rspauth="	2	0B49	0008	[5]	3.2.3
"realm="	2	0B8E	0006	[5]	3.2.1
"domain="	2	0B6C	0007	[5]	3.2.1
"nonce="	2	0C4D	0006	[5]	3.2.1
"opaque="	4	08D7	0007	[5]	3.2.1
"stale="	4	019A	0006	[5]	3.2.1
"true"	4	058B	0004	[5]	3.2.1,

"false"

[22] 5.2
4 0C95 0005 [5] 3.2.1

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"algorithm="	2 0CA0 000A [5] 3.2.1, [18] 3.1
"MD5"	2 0B94 0003 [5] 3.2.1, [18] 3.1
"MD5-sess"	2 0C11 0008 [5] 3.2.1, [18] 3.1
"auth"	4 046E 0004 [5] 3.2.1
"auth-int"	4 046E 0008 [5] 3.2.1
"AKAv"	2 0C0B 0004 [18] 3.1, 6
"AKAv1-MD5"	2 0C0B 0009 [18] 3.1, 6
"auts="	4 0901 0005 [18] 3.4
"digest-integrity"	4 0270 0010 [19] 3.3
"ipsec-ike"	4 07DA 0009 [19] 3.3
"ipsec-man"	4 0BDE 0009 [19] 3.3
"smime"	4 02D3 0005 [19] 3.3
";alg="	4 08DE 0005 [19] 3.3
";purpose="	5 00C9 0009 [2] 20.9
"icon"	5 0E1D 0004 [2] 20.9, 20.11
"info"	5 0D2A 0004 [2] 20.9
"card"	5 0120 0004 [2] 20.9
";expires="	2 0DF9 0009 [2] 25.1, [8] 8.4
"render"	5 0B89 0006 [2] 20.11
"session"	5 0C15 0007 [2] 20.11, [34] 4.2
"alert"	5 0D06 0005 [2] 20.11
";handling="	5 00B6 000A [2] 20.11
"optional"	2 0D00 0008 [2] 20.11, [11] 4, [2] 20.11, [11] 4
"required"	5 0A03 0008 [2] 20.11
"text"	5 010D 0004 [2] 25.1
"image"	5 0117 0005 [2] 25.1
"audio"	5 0CFC 0005 [2] 25.1
"video"	5 0B00 0005 [2] 25.1
"application"	2 05CB 000B [2] 25.1
"application/sdp"	2 0B33 000F [2] 25.1
"message"	4 02D6 0007 [2] 25.1,
"sip"	4 0646 0003 [14] 1
"sipfrag"	4 0646 0007 [14] 2
"multipart"	4 086D 0009 [2] 25.1, 7.4.1
"sdp"	2 07A8 0003
"xml"	2 0E61 0003
"Mon, "	4 08E8 0005 [2] 25.1
"Tue, "	4 08E3 0005 [2] 25.1
"Wed, "	4 08F7 0005 [2] 25.1
"Thu, "	4 098A 0005 [2] 25.1
"Fri, "	4 08FC 0005 [2] 25.1
"Sat, "	4 08F2 0005 [2] 25.1
"Sun, "	4 0893 0005 [2] 25.1

" Jan "
" Feb "

4 04D5 0005 [2] 25.1
4 04BD 0005 [2] 25.1

" Mar "	4	09F3	0005	[2]	25.1
" Apr "	4	043D	0005	[2]	25.1
" May "	4	09DA	0005	[2]	25.1
" Jun "	4	03AE	0005	[2]	25.1
" Jul "	4	0393	0005	[2]	25.1
" Aug "	4	09A5	0005	[2]	25.1
" Sep "	4	03C9	0005	[2]	25.1
" Oct "	4	09C0	0005	[2]	25.1
" Nov "	4	0378	0005	[2]	25.1
" Dec "	4	0C3B	0005	[2]	25.1
" GMT"	4	0987	0004	[2]	25.1
";tag="	1	0F0A	0005	[2]	25.1
"emergency"	4	0297	0009	[2]	20.26
"urgent"	4	0B2D	0006	[2]	20.26
"normal"	4	0C1B	0006	[2]	20.26
"non-urgent"	4	0B29	000A	[2]	20.26
";duration="	4	0837	000A	[2]	20.33
";maddr="	4	08D0	0007	[2]	20.42
";received="	4	082D	000A	[2]	20.42
";branch="	5	0EA6	0008	[2]	20.42
";branch=z9hG4bK"	1	0EA6	000F	[2]	8.1.1.7
"SIP"	5	0E6B	0003	[2]	25.1,
				[16]	2
"UDP"	2	0E5E	0003	[2]	20.42
"TCP"	2	0E5B	0003	[2]	20.42
"TLS"	4	0891	0003	[2]	20.42
"SCTP"	4	0CBA	0004	[2]	20.42
"active"	4	0A23	0006	[8]	8.4
"pending"	4	0329	0007	[8]	8.4
"terminated"	4	0C8B	000A	[8]	8.4
";reason="	4	08C8	0008	[8]	8.4
";retry-after="	4	0760	000D	[8]	8.4
"deactivated"	4	0250	000B	[8]	8.4
"probation"	4	0E83	0009	[8]	8.4
"rejected"	4	0939	0008	[8]	8.4
"timeout"	4	06A3	0007	[8]	8.4
"giveup"	4	0229	0006	[8]	8.4
"noresource"	4	03DA	000A	[8]	8.4
";id="	4	090E	0004	[8]	8.4
"100rel"	2	0E47	0006	[9]	8.1
"precondition"	2	0B1E	000C	[11]	8
"refer"	3	0D4A	0005	[12]	10
"to-tag"	4	0516	0006	[13]	3.2
"from-tag"	4	030F	0008	[13]	3.2
"replaces"	4	02F2	0008	[13]	3.4
"Q.850"	5	0B51	0005	[16]	2
";cause="	5	00F9	0007	[16]	2
";text="	5	010C	0006	[16]	2
"path"	3	0B41	0004	[15]	3

";refresher="

"uac"

4 07EE 000B [17] 4

4 0775 0003 [17] 4

"uas"	4	0922	0003	[17]	4
"timer"	4	0B85	0005	[17]	7.1
";class="	5	00F2	0007	[22]	5.1
";duplex="	5	00E3	0008	[22]	5.1
";feature="	5	00C0	0009	[22]	5.1
";language="	5	00A2	000A	[22]	5.1
";media="	5	00EB	0007	[22]	5.1
";mobility="	5	0098	000A	[22]	5.1
"fixed"	5	0112	0005	[22]	5.1
"mobile"	5	0106	0006	[22]	5.1
"personal"	5	02B8	0008	[22]	5.1
"business"	5	063F	0008	[22]	5.1
"full"	5	011C	0004	[22]	5.1
"half"	5	0C7F	0004	[22]	5.1
"receive-only"	5	0206	000C	[22]	5.1
"send-only"	5	0AEC	0009	[22]	5.1
"voice-mail"	5	0000	000A	[22]	5.1
"attendant"	5	069B	0009	[22]	5.1
";priority="	5	00AC	000A	[22]	5.1
"description"	5	0142	000B	[22]	5.1
";methods="	5	00D2	0009	[22]	5.1
";scheme="	5	00DB	0008	[22]	5.2
";only="	5	0100	0006	[22]	5.2
";q="	4	0925	0003	[2]	25.1,
				[22]	5.2, [19] 3.3
"proxy"	5	0355	0005	[22]	5.5
"redirect"	5	01BE	0008	[22]	5.5
"cancel"	5	014F	0006	[22]	5.5
"no-cancel"	5	014C	0009	[22]	5.5
"fork"	5	063B	0004	[22]	5.5
"no-fork"	5	0638	0007	[22]	5.5
"recurse"	5	0AE7	0007	[22]	5.5
"non-recurse"	5	0AE3	000B	[22]	5.5
"parallel"	5	022E	0008	[22]	5.5
"sequential"	5	0C98	000A	[22]	5.5
"queue"	5	0E8E	0005	[22]	5.5
"no-queue"	5	0E8B	0008	[22]	5.5
";comp=sigcomp"	1	0E77	000D	[23]	6
"header"	4	0B44	0006	[34]	4.2
"user"	4	0AA9	0004	[34]	4.2
"none"	2	0E20	0004	[34]	4.2,
				[11]	4
"critical"	4	08A8	0008	[34]	4.2
"id"	3	03D6	0002	[33]	13.1
"100 "	5	0D75	0004	[2]	21.1.1
"100 Trying"	2	0D75	000A	[2]	21.1.1
"180 "	5	0D5F	0004	[2]	21.1.2
"180 Ringing"	2	0D5F	000B	[2]	21.1.2
"181 "	5	0236	0004	[2]	21.1.3

"181 Call Is Being Forwarded"
"182 "

4 0236 001B [2] 21.1.3
5 0718 0004 [2] 21.1.4

"182 Queued"	4	0718	000A	[2]	21.1.4
"183 "	5	0C67	0004	[2]	21.1.5
"183 Session Progress"	2	0C67	0014	[2]	21.1.5
"200 "	5	0EEE	0004	[2]	21.2.1
"200 OK"	1	0EEE	0006	[2]	21.2.1
"202 "	5	0969	0004	[8]	8.3.1
"202 Accepted"	3	0969	000C	[8]	8.3.1
"300 "	5	02C0	0004	[2]	21.3.1
"300 Multiple Choices"	4	02C0	0014	[2]	21.3.1
"301 "	5	0495	0004	[2]	21.3.2
"301 Moved Permanently"	4	0495	0015	[2]	21.3.2
"302 "	5	0480	0004	[2]	21.3.3
"302 Moved Temporarily"	4	0480	0015	[2]	21.3.3
"305 "	5	066C	0004	[2]	21.3.4
"305 Use Proxy"	4	066C	000D	[2]	21.3.4
"380 "	5	03FA	0004	[2]	21.3.5
"380 Alternative Service"	4	03FA	0017	[2]	21.3.5
"400 "	5	0A0B	0004	[2]	21.4.1
"400 Bad Request"	4	0A0B	000F	[2]	21.4.1
"401 "	5	0CAA	0004	[2]	21.4.2
"401 Unauthorized"	2	0CAA	0010	[2]	21.4.2
"402 "	5	051C	0004	[2]	21.4.3
"402 Payment Required"	4	051C	0014	[2]	21.4.3
"403 "	5	03CE	0004	[2]	21.4.4
"403 Forbidden"	4	03CE	000D	[2]	21.4.4
"404 "	5	065F	0004	[2]	21.4.5
"404 Not Found"	4	065F	000D	[2]	21.4.5
"405 "	5	0458	0004	[2]	21.4.6
"405 Method Not Allowed"	4	0458	0016	[2]	21.4.6
"406 "	5	0556	0004	[2]	21.4.7
"406 Not Acceptable"	4	0556	0012	[2]	21.4.7
"407 "	5	01A0	0004	[2]	21.4.8
"407 Proxy Authentication Required"	4	01A0	0021	[2]	21.4.8
"408 "	5	03E4	0004	[2]	21.4.9
"408 Request Timeout"	4	03E4	0013	[2]	21.4.9
"410 "	5	076D	0004	[2]	21.4.10
"410 Gone"	4	076D	0008	[2]	21.4.10
"413 "	5	0BED	0004	[2]	21.4.11
"413 Request Entity Too Large"	4	0BED	001C	[2]	21.4.11
"414 "	5	0212	0004	[2]	21.4.12
"414 Request-URI Too Long"	4	0212	0018	[2]	21.4.12
"415 "	5	02A0	0004	[2]	21.4.13
"415 Unsupported Media Type"	4	02A0	001A	[2]	21.4.13
"416 "	5	0280	0004	[2]	21.4.14
"416 Unsupported URI Scheme"	4	0280	001A	[2]	21.4.14
"420 "	5	0AD3	0004	[2]	21.4.15
"420 Bad Extension"	4	0AD3	0011	[2]	21.4.15
"421 "	5	0442	0004	[2]	21.4.16
"421 Extension Required"	4	0442	0016	[2]	21.4.16

"422 "

5 0BBF 0004 [17] 6

"422 Session Timer Too Small"

4 0BBF 001B [17] 6

"423 "	5	02FA	0004	[2]	21.4.17
"423 Interval Too Brief"	4	02FA	0016	[2]	21.4.17
"480 "	5	0941	0004	[2]	21.4.18
"480 Temporarily Unavailable"	3	0941	001B	[2]	21.4.18
"481 "	5	0179	0004	[2]	21.4.19
"481 Call/Transaction Does Not Exist"	4	0179	0023	[2]	21.4.19
"482 "	5	05A1	0004	[2]	21.4.20
"482 Loop Detected"	4	05A1	0011	[2]	21.4.20
"483 "	5	0342	0004	[2]	21.4.21
"483 Too Many Hops"	4	0342	0011	[2]	21.4.21
"484 "	5	0155	0004	[2]	21.4.22
"484 Address Incomplete"	4	0155	0016	[2]	21.4.22
"485 "	5	0C53	0004	[2]	21.4.23
"485 Ambiguous"	4	0C53	000D	[2]	21.4.23
"486 "	5	09F8	0004	[2]	21.4.24
"486 Busy Here"	3	09F8	000D	[2]	21.4.24
"487 "	5	025B	0004	[2]	21.4.25
"487 Request Terminated"	4	025B	0016	[2]	21.4.25
"488 "	5	02DD	0004	[2]	21.4.26
"488 Not Acceptable Here"	4	02DD	0017	[2]	21.4.26
"489 "	5	0B10	0004	[8]	8.3.2
"489 Bad Event"	4	0B10	000D	[8]	8.3.2
"491 "	5	0530	0004	[2]	21.4.27
"491 Request Pending"	4	0530	0013	[2]	21.4.27
"493 "	5	0568	0004	[2]	21.4.28
"493 Undecipherable"	4	0568	0012	[2]	21.4.28
"494 "	5	0124	0004	[19]	3.3.1
"494 Security Agreement Required"	4	0124	001F	[19]	3.3.1
"500 "	5	01C6	0004	[2]	21.5.1
"500 Server Internal Error"	4	01C6	0019	[2]	21.5.1
"501 "	5	0543	0004	[2]	21.5.2
"501 Not Implemented"	4	0543	0013	[2]	21.5.2
"502 "	5	05D7	0004	[2]	21.5.3
"502 Bad Gateway"	4	05D7	000F	[2]	21.5.3
"503 "	5	0411	0004	[2]	21.5.4
"503 Service Unavailable"	4	0411	0017	[2]	21.5.4
"504 "	5	0B73	0004	[2]	21.5.5
"504 Server Time-out"	4	0B73	0013	[2]	21.5.5
"505 "	5	0B54	0004	[2]	21.5.6
"505 Version Not Supported"	4	0B54	0019	[2]	21.5.6
"513 "	5	04EF	0004	[2]	21.5.7
"513 Message Too Large"	4	04EF	0015	[2]	21.5.7
"580 "	5	0B96	0004	[11]	8
"580 Precondition Failure"	4	0B96	0018	[11]	8
"600 "	5	0928	0004	[2]	21.6.1
"600 Busy Everywhere"	3	0928	0013	[2]	21.6.1
"603 "	5	0C40	0004	[2]	21.6.2
"603 Decline"	4	0C40	000B	[2]	21.6.2
"604 "	5	01ED	0004	[2]	21.6.3

"604 Does Not Exist Anywhere"
"606 "

4 01ED 001B [2] 21.6.3
5 058F 0004 [2] 21.6.4

"606 Not Acceptable"	4	058F	0012	[2]	21.6.4
"687 "	5	04DA	0004	[13]	3.5
"687 Dialog Terminated"	4	04DA	0015	[13]	3.5
"Anonymous"	3	0ECC	0009	[2]	8.1.1.3

Table A.1: SIP input strings for the SIP/SDP dictionary

Appendix B. SDP input strings to the SIP/SDP static dictionary

For reference, this section lists the SDP input strings that were used in generating the dictionary, as well as a priority value, the offset of the string in the generated dictionary, the length of the string, and one or more references into the referenced documents that motivate the presence of this string. Note that the notation "[CRLF]" stands for a sequence of two bytes with the values 0x0d and 0x0a, respectively.

The priority value is used for determining the position of the string in the dictionary. Lower priority values (higher priorities) cause the string to occur at a later position in the dictionary, making it more efficient to reference the string in certain compression algorithms. Hence, small priority values were assigned to strings more likely to occur.

String	Pr	Off	Len	References
=====	==	=====	=====	=====
"v=0[CRLF]o="	2	0D7F	0007	[24] 6
"[CRLF]s="	2	0DEB	0004	[24] 6
"[CRLF]s= "	2	0DEB	0005	[32] 5
"[CRLF]i="	4	0906	0004	[24] 6
"[CRLF]u="	4	091E	0004	[24] 6
"[CRLF]e="	4	091A	0004	[24] 6
"[CRLF]c=IN IP4 "	3	0A82	000B	[24] 6
"[CRLF]c=IN IP6 "	2	0D6A	000B	[24] 6
"[CRLF]c="	5	0A82	0004	[24] 6
"[CRLF]b="	3	0AAE	0004	[24] 6
"[CRLF]t="	2	0D0B	0004	[24] 6
"[CRLF]t=0 0"	2	0D0B	0007	[32] 5
"[CRLF]r="	4	0916	0004	[24] 6
"[CRLF]z="	4	090A	0004	[24] 6
"[CRLF]k=clear:"	4	0823	000A	[24] 6
"[CRLF]k=base64:"	4	07E3	000B	[24] 6
"[CRLF]k=uri:"	4	08A0	0008	[24] 6
"[CRLF]k=prompt:"	4	06C9	000B	[24] 6
"[CRLF]k="	5	06C9	0004	[24] 6
"[CRLF]a=cat:"	4	08C0	0008	[24] 6
"[CRLF]a=keywds:"	4	07F9	000B	[24] 6
"[CRLF]a=tool:"	4	087F	0009	[24] 6
"[CRLF]a=ptime:"	4	0819	000A	[24] 6
"[CRLF]a=maxptime:"	4	0753	000D	[24] 6
"[CRLF]a=rtpmap:"	2	0DAB	000B	[24] 6, [32] 5
"[CRLF]a=recvonly"	3	0A5E	000C	[24] 6
"[CRLF]a=sendrecv"	3	0AF5	000C	[24] 6
"[CRLF]a=sendonly"	3	0A76	000C	[24] 6
"[CRLF]a=inactive"	3	0A1D	000C	[24] 6
"[CRLF]a=orient:portrait"	4	0504	0013	[24] 6

"[CRLF]a=orient:landscape"
"[CRLF]a=orient:seascape"

4 0317 0014 [24] 6
4 060C 0013 [24] 6

"[CRLF]a=type:broadcast"	4	057A	0012	[24]	6
"[CRLF]a=type:meeting"	4	06B9	0010	[24]	6
"[CRLF]a=type:moderated"	4	064D	0012	[24]	6
"[CRLF]a=type:test"	4	06AA	000D	[24]	6
"[CRLF]a=type:H.332"	4	095C	000E	[24]	6
"[CRLF]a=type:recvonly"	4	0679	0011	[24]	6
"[CRLF]a=charset:"	4	07B0	000C	[24]	6
"[CRLF]a=sdplang:"	4	07A4	000C	[24]	6
"[CRLF]a=lang:"	4	0888	0009	[24]	6
"[CRLF]a=framerate:"	4	0730	000E	[24]	6
"[CRLF]a=quality:"	4	078C	000C	[24]	6
"[CRLF]a=fmtp:"	2	0DF0	0009	[24]	6
"[CRLF]a=curr:"	2	0E02	0009	[11]	4
"[CRLF]a=des:"	2	0E24	0008	[11]	4
"[CRLF]a=conf:"	2	0E0B	0009	[11]	4
"[CRLF]a=mid:"	4	0898	0008	[26]	3
"[CRLF]a=group:"	4	080F	000A	[26]	3
"[CRLF]a=key-mgmt:MIKEY"	4	0330	0012	[28]	2.1,
			[29]	6	
"[CRLF]a=key-mgmt:"	4	0330	000D	[28]	2.1
"[CRLF]a="	5	0317	0004	[24]	6
"[CRLF]m=audio "	2	0DD7	000A	[24]	6
"[CRLF]m=video "	2	0DE1	000A	[24]	6
"[CRLF]m=application "	4	05C7	0010	[24]	6
"[CRLF]m=data "	4	0864	0009	[24]	6
"[CRLF]m=control "	4	0798	000C	[24]	6
"[CRLF]m="	5	05C7	0004	[24]	6
"AS "	3	0AB2	0003	[24]	6
"CT "	3	0AB5	0003	[24]	6
"RTP/AVP "	2	0DA3	0008	[24]	A
"RTP/SAVP "	3	0A29	0009	[30]	12
"RTP/AVPF "	3	0A32	0009	[31]	4.1
"udp"	4	0A3B	0003	[2]	25.1,
			[24]	A, [2]	25.1, [24] A
"0.0.0.0"	4	0D11	0007	[24]	A
"qos"	2	0E58	0003	[11]	4
"mandatory"	2	0BE4	0009	[11]	4
"optional"	2	0D00	0008	[2]	20.11,
			[11]	4, [2]	20.11, [11] 4
"none"	2	0E20	0004	[34]	4.2,
			[11]	4	
"failure"	4	0C82	0007	[11]	4
"unknown"	4	0632	0007	[11]	4
"e2e"	2	0C08	0003	[11]	4
"local"	2	0BD9	0005	[11]	4
"remote"	2	0C87	0006	[11]	4
"send"	2	0A7A	0004	[11]	4
"recv"	2	0682	0004	[11]	4
"sendrecv"	2	0AF9	0008	[11]	4

"AMR"

2 0DA1 0003 [25] 8

"octet-align="

4 0B04 000C [25] 8

"mode-set="	4	0876	0009	[25]	8
"mode-change-period="	4	061F	0013	[25]	8
"mode-change-neighbor="	4	05B2	0015	[25]	8
"crc="	4	0912	0004	[25]	8
"robust-sorting="	4	01DE	000F	[25]	8
"interleaving="	4	0473	000D	[25]	8
"channels="	4	0777	0009	[25]	8
"octet-align"	4	0B04	000B	[25]	8
"telephone-event"	4	0169	000F	[27]	3.3, 6.1
"events"	4	0173	0006	[27]	6.1
"rate"	4	065A	0004	[27]	6.1, 6.2
"tone"	4	03F6	0004	[27]	6.2

Table B.1: SDP input strings for the SIP/SDP dictionary

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Expiration Date

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