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Authors: D. G. Petrie T. McCarthy-Howe

 SIPEz LLC Strolid

The JSON format for vCon - Conversation Data Container

Abstract

A vCon is the container for data and information relating to a real-time, human conversation. It is analogous to a [vCard] which enables the definition, interchange and storage of an individual's various points of contact. The data contained in a vCon may be derived from any multimedia session, traditional phone call, video conference, SMS or MMS message exchange, webchat or email thread. The data in the container relating to the conversation may include Call Detail Records (CDR), call meta data, participant identity information (e.g. STIR PASSporT), the actual conversational data exchanged (e.g. audio, video, text), realtime or post conversational analysis and attachments of files exchanged during the conversation. A standardized conversation container enables many applications, establishes a common method of storage and interchange, and supports identity, privacy and security efforts (see [vCon-white-paper])

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://ietf-wg-vcon.github.io/draft-ietf-vcon-vcon-container/draft-ietf-vcon-vcon-container.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-ietf-vcon-vcon-container/>.

Discussion of this document takes place on the Virtualized Conversations Working Group mailing list (<mailto:vcon@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/vcon/>. Subscribe at <https://www.ietf.org/mailman/listinfo/vcon/>.

Source for this draft and an issue tracker can be found at <https://github.com/ietf-wg-vcon/draft-ietf-vcon-vcon-container>.

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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Table of Contents

1. [Introduction](#)
 - 1.1. [What's in a vCon?](#)
 - 1.2. [Use Cases and Requirements](#)
2. [Conventions and Definitions](#)
 - 2.1. [Terminology](#)
 - 2.2. [JSON Notation](#)
 - 2.3. [Inline Files](#)
 - 2.3.1. [body](#)
 - 2.3.2. [encoding](#)
 - 2.4. [Externally Referenced Files](#)
 - 2.4.1. [url](#)
 - 2.4.2. [alg](#)
 - 2.4.3. [signature](#)
3. [vCon JSON Object](#)
4. [Unsigned Form of vCon Object](#)
 - 4.1. [vCon JSON Object Keys and Values](#)
 - 4.1.1. [vcon](#)
 - 4.1.2. [uuid](#)
 - 4.1.3. [created_at](#)
 - 4.1.4. [updated_at](#)
 - 4.1.5. [subject](#)
 - 4.1.6. [redacted](#)
 - 4.1.7. [appended](#)
 - 4.1.8. [group Objects Array](#)
 - 4.1.9. [parties Objects Array](#)
 - 4.1.10. [dialog Objects Array](#)

- [4.1.11. analysis Objects Array](#)
 - [4.1.12. attachments Objects Array](#)
 - [4.2. Party Object](#)
 - [4.2.1. tel](#)
 - [4.2.2. stir](#)
 - [4.2.3. mailto](#)
 - [4.2.4. name](#)
 - [4.2.5. validation](#)
 - [4.2.6. jCard](#)
 - [4.2.7. gmlpos](#)
 - [4.2.8. civicaddress](#)
 - [4.2.9. timezone](#)
 - [4.2.10. uuid](#)
 - [4.2.11. role](#)
 - [4.2.12. contact list](#)
 - [4.3. Dialog Object](#)
 - [4.3.1. type](#)
 - [4.3.2. start](#)
 - [4.3.3. duration](#)
 - [4.3.4. parties](#)
 - [4.3.5. originator](#)
 - [4.3.6. mimetype](#)
 - [4.3.7. filename](#)
 - [4.3.8. Dialog Content](#)
 - [4.3.9. disposition](#)
 - [4.3.10. party history Objects Array](#)
 - [4.3.11. Dialog Transfer](#)
 - [4.3.12. campaign](#)
 - [4.3.13. interaction type](#)
 - [4.3.14. interaction id](#)
 - [4.3.15. skill](#)
 - [4.3.16. application](#)
 - [4.4. Analysis Object](#)
 - [4.4.1. type](#)
 - [4.4.2. dialog](#)
 - [4.4.3. mimetype](#)
 - [4.4.4. filename](#)
 - [4.4.5. vendor](#)
 - [4.4.6. product](#)
 - [4.4.7. schema](#)
 - [4.4.8. Analysis Content](#)
 - [4.5. Attachment Object](#)
 - [4.5.1. type or purpose](#)
 - [4.5.2. start](#)
 - [4.5.3. party](#)
 - [4.5.4. mimetype](#)
 - [4.5.5. filename](#)
 - [4.5.6. Attachment Content](#)
 - [4.6. Group Object](#)
- [5. Security Considerations](#)
 - [5.1. Signing Externally Referenced Files](#)
 - [5.2. Signed Form of vCon Object](#)
 - [5.2.1. Signature Object](#)

- [5.2.2. Header Object](#)
- [5.3. Encrypted Form of vCon Object](#)
 - [5.3.1. Unprotected Object](#)
 - [5.3.2. Recipient Object](#)
 - [5.3.3. Header Object](#)
- [6. IANA Considerations](#)
- [7. References](#)
 - [7.1. Normative References](#)
 - [7.2. Informative References](#)
- [Appendix A. Contact Center Use Cases](#)
- [Appendix B. Example vCons](#)
 - [B.1. Two Party Call vCon With Inline Recording](#)
 - [B.2. Text Chat vCon](#)
 - [B.3. Email Thread Multipart vCon](#)
 - [B.4. Email Thread Text vCon](#)
 - [B.5. Two Party Call vCon With Externally Referenced Recording](#)
 - [B.6. Two Party Call vCon with Analysis](#)
 - [B.7. Signed vCon](#)
 - [B.8. Encrypted vCon](#)
 - [B.9. Redacted vCon](#)
 - [B.10. Appended Signed vCon](#)
 - [B.11. vCon Group](#)
- [Acknowledgments](#)
- [Authors' Addresses](#)

1. Introduction

The generation of conversational data, contained in transcripts and multi-media files, is common in business, especially in customer facing organizations. However, the storage, analysis and sharing of the data they contain is not currently a standard. Standardizing a container for conversation data (vCon) has numerous advantages, and enables the management of the conversation's content. Very often the system providing the communications service, the consumer and/or owner of the communications data and the communications analysis services are distinct systems and in many case separate business entities. The point of a vCon is to provide a standard means of exchanging communications data between these systems and services. The use of vCons can ease service integration by using a common container and format for enterprise communications. A vCon becomes the standardized input to communication analysis tools and machine learning and categorization. For a sales lead organization, a vCon can be the container of assets sold to sales teams. For conversations of record, the vCon can be a legal instrument. For machine learning efforts, vCons can track what information was used in the training of models, so that as the result of a customer requested deletion of their data, the affected models can be identified.

1.1. What's in a vCon?

A vCon contains four major categories of data: metadata , dialog , analysis and attachments. The metadata portion allows for an expanded set of data from a typical call detail record ([[CDR](#)]), with

identifications of the participants or parties to the conversation, references to related or earlier versions of the vCon. The dialog portion contains a set of multimedia and mime elements, each representing the actual, physical conversation in its original media form: text, audio or video. The analysis portion contains data derived from the metadata and dialog portions, intended to carry items like transcripts, translations, summaries, text to speech, sentiment analysis and other semantic tagging. Finally, the attachment portion contains any other documents, such as slide deck or sales lead information, which provides context and support for the conversation itself. The vCon may also contain integrity checking information such as the issuer of the vCon and tamperproof features such as signatures.

A vCon acts as the definition of the conversation, and are created by systems during and after the conversation itself. Some communication modes, like SMS texting, lack natural session boundaries and require explicit definition. vCons may have two or more parties involved, but at least one should be a human. For instance, an interaction between a bot and a human is an appropriate scope for vCons, but a conversation between two bots would not.

Due to the size and complexity of some portions of a vCon, both inline and externally referenced dialog, analysis, attachments and other vCon reference assets are supported. For instance, vCons may reference a videoconference media recording as an external URL with an accompanying signature of the contents to detect tampering. Alternatively, vCons may directly contain the media of the entire dialog internally, keeping the conversation in one place, and optionally encrypted.

vCons are designed to be a digital asset, versioned and signed. For instance, different versions of vCon may arise due to redaction (e.g. for PII or other reasons), added analysis or the addition of other content. In the metadata, vCons contain the unique ID of the parent vCon, such that they may be traversed while maintaining their data integrity and provenance.

1.2. Use Cases and Requirements

The use cases for vCon in a contact center environment are explored in the appendix: [cc-usecases](#) ([Appendix A](#)). These use cases and others have led to the metadata contents of this definition of the vCon container.

TODO: would love to see use case Internet-Drafts for ECRIT and Messaging.

Many of the initial set of use cases for vCons are expected to be in the interchange between front end and back end application and lower layers of the network stack, critical for enablement of analysis of conversations. It is expected that JavaScript handling of vCons in the front end and RESTful interfaces and back end platforms will be

used for operations and manipulation of vCons. Many media analysis services which will be used with vCons, such as transcription, already use JSON based interfaces. For this reason, JSON has been chosen for the initial format binding of vCons and the scope of this document. Other bindings (e.g. [CBOR] or [CDDL]) may be consider for vCon in the future in other documents.

An outline of the vCon requirements derived from the explored use case follows:

- *Standardize container for conversational data exchange
- *Consolidation of data and information for a conversation
- *Multiple modes of communication, changing over time
- *Snapshots of conversation during or once completed along with analysis
- *Ease of integration of services and analysis
- *Better organize conversational data so that it can be handled in a consistent, privacy safer means
- *Immutable
- *Hiding of PII or entire conversation
- *Amendable with additional information and data elements

Define a standard for exchange of conversational data in a sea of modes, platforms and service offerings for conversations.

Example conversational modes and protocols:

- *SMS
- *MMS
- *JABBER
- *SIMPLE
- *Proprietary web chat
- *SMTP
- *PSTN
- *SIP
- *WEBRTC

- *Proprietary video conferencing

The following are considered not in scope or non-requirements:

- *Real-time streaming or updating of conversational data

- *Transport mechanisms

- *Storage or databases specifications

- *Methods of redaction of text, audio or video media

- *Validation of redactions or appended data beyond the signature of the domain making the changes to the conversational data (e.g. Merkle tree like redactions)

- *Standardization of analysis data formats or file media types

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.

2.1. Terminology

- *analysis - analysis, transformations, summary, sentiment, or translation typically of the dialog data

- *conversation - an exchange of communication using text, audio or video medium between at least one human and one or more bots or humans

- *de-identification - removal of all information that could identify a party in a conversation. This includes PII as well as audio and video recordings. Voice recordings might be re-vocalized with a different speaker.

- *dialog - the captured conversation in its original form (e.g. text, audio or video)

- *encrypted form - encrypted JWE document with the JWS signed vCon form contained in the ciphertext

- *file - a data block either included or referenced in a vCon

- *object - JSON object containing key and value pairs

- *parameter - JSON key and value pair

- *party - an observer or participant to the conversation, either passive or active
- *payload - the contents or bytes that make up a file
- *PII - Personal Identifiable Information
- *PII masked - may include voice recordings, but PII is removed from transcripts and recordings (audio and video).
- *vCon - container for conversational information
- *vCon instance - a vCon populated with data for a specific conversation
- *vCon instance version - a single version of an instance of a conversation, which may be modified to redact or append additional information forming a subsequent vCon instance version
- *vCon syntax version - the version for the data syntax used for form a vCon
- *signed form - JWS signed document with the unsigned vCon form contained in the payload

2.2. JSON Notation

For the ease of documentation, the convention for [\[JSON\]](#) notation used in this document is copied from sections 1.1-1.5 of [\[JMAP\]](#).

Date - A string that **MUST** have the form of an [\[RFC3339\]](#) date string as defined for the Date type in section 1.4 of [\[JMAP\]](#).

"String" - a JSON string type

"UnsignedInt" - a positive JSON integer as defined in section 1.3 of [\[JMAP\]](#).

"UnsignedFloat" - a positive JSON floating point number containing a decimal point as defined in section 6 of [\[JSON\]](#).

"Mime" - A "String" value that **MUST** be of the following form as defined in section 5.1 of [\[MIME\]](#): type "/" subtype

"A[]" and array of values of type A.

All parameters are assumed to be mandatory unless other wise noted.

Objects or arrays with no or null values **MAY** be excluded from the vCon.

2.3. Inline Files

Objects that contain a file or data inline (i.e. within the vCon) **MUST** have the parameters: body and encoding. JSON does not support binary data values. For this reason inline files **MUST** be base64url (see Section 2 [[JWS](#)]) encoded to be included as a valid JSON string value if they are not already valid JSON strings.

2.3.1. body

The body parameter contains the payload of the file to be included inline. Depending upon the data in the file, it may require encoding to be used as a valid JSON string value.

*body: "String"

2.3.2. encoding

The encoding parameter describes the type of encoding that was performed on the string value of the body parameter.

*encoding: "String"

This **MUST** be one of the following strings:

- "base64url": The payload of the file has been base64url encoded and provided as the string value of the body parameter.
- "json": The value of the body string is a JSON object.
- "none": The payload of the file is a valid JSON string and can be included without modification as the string value to the body parameter.

2.4. Externally Referenced Files

Files and data stored externally from the vCon **MUST** be "signed" to ensure that they have not been modified. Objects that refer to a file which is externally stored from the vCon **MUST** have the parameters: url, alg and signature. These parameters are defined in the following subsections. The use of [[SHA-512](#)] hash for ensuring that the externally referenced data or file has not been modified, is defined in this document. Other methods of ensuring integrity may be added in the future. The following subsections define how the specific algorithm used and how that signature information is included in a vCon so that the content can be verified.

2.4.1. url

The url value contains the [[HTTPS](#)] URL where the externally referenced file is stored. HTTPS **MUST** be used for retrieval to protect the privacy of the contents of the file.

*url: "String"

2.4.2. alg

The alg parameter describes the method used for signing the file payload at the given url. Only one method of signing of externally referenced files is defined in this document. So only one value is defined for the alg parameter.

*alg: "String"

This **SHOULD** be the following string:

- "SHA-512": The algorithm used for signing the externally referenced file is defined in section 6.3 and 6.4 of [[SHA-512](#)].

2.4.3. signature

The [[SHA-512](#)] hash on the externally referenced file is included in the signature string value.

*signature: "String"

The string value of the signature parameter is the Base64Url Encoded value of the SHA-512 hash (as defined in section 6.3 and 6.4 [[SHA-512](#)]) of the body of the content at the given url.

3. vCon JSON Object

The JSON form of a vCon is contained in a JSON object in one of three forms:

*unsigned

*signed

*encrypted

The unsigned form of the vCon has a single top level object. This top level vCon object is also contained as described in the [signed](#) ([Section 5.2](#)) and [encrypted](#) ([Section 5.3](#)) forms of the vCon. The selection of the JSON format enables interchange between application and lower layers of the network stack, critical for enablement of analysis of conversations.

4. Unsigned Form of vCon Object

The unsigned form of the top level vCon object is necessary as in many cases, a vCon will be partially constructed and in process as conversation data is collected. This may change while the conversation is in progress or on-going. The vCon may start with only meta data and party information, then progress to contain dialog information. It may then get analysis added or it could be passed to another security domain for analysis.

A vCon may be constructed across several security domains. When a vCon is to be exported from one security domain to another, it **SHOULD** be signed or encrypted by the domain that constructed it. The subsequent domain may have need to redact or append data to the vCon. Alternatively the originating domain may want to redact the vCon before providing it to an other domain. The second or subsequent domain, **MAY** modify the prior vCon instance version and when complete or exporting to another security domain, it **SHOULD** sign or encrypt the new vCon instance version. The new vCon instance version **SHOULD** refer to the prior vCon instance version via the redacted ([Section 4.1.6](#)) or appended ([Section 4.1.7](#)) parameters.

4.1. vCon JSON Object Keys and Values

The keys and values for the top level vCon JSON object are defined in the following subsections.

4.1.1. vcon

The the value of vcon parameter contains the syntactic version of the JSON format used in the vCon.

*vcon: "String"

For syntax defined in this document, the string **MUST** have the value: "0.0.1"

4.1.2. uuid

The [[UUID](#)] for the vCon is used to refer to it when privacy or security may not allow for inclusion or URL reference to a vCon. The UUID **MUST** be globally unique.

*uuid: "String"

The value of the string **SHOULD** be generated using the version 8 UUID defined in [[UUID](#)] which is generated identically to a version 7 UUID with the exception that:

-rand_b/custom_c is generated from the high 62 bits of the SHA-1 hash of the FQHN string

-the variant and version fields are set as described for version 8 UUID

The DNS name string used in generating the uuid value **SHOULD** be the same FQHN, or a subdomain to allow for more distributed generation of UUIDs, as would used in the signing certificate as they are the same domains of uniqueness.

4.1.3. created_at

The created_at parameter provides the creation time of this vcon, which **MUST** be present, and should not changed once the vcon object is created.

*created_at: "Date"

4.1.4. updated_at

The updated_at parameter provides the last modified time of this vcon, which **MAY** be present. For unsigned forms, the updated_at of the vcon object **SHOULD** be updated as it is modified. For signed forms of the vCon object, the updated_at contains the time when this vcon was last signed. Future updates **MUST** first set the updated_at to the new signing time as the vcon object is signed again.

*updated_at: "Date"

4.1.5. subject

The subject or the topic of the conversation is provided in the subject parameter. This parameter is optional as not all conversations have a defined subject. Email threads and prescheduled calls and video conferences typically have a subject which can be captured here. The subject may also be derived from analysis of the dialog.

*subject: "String" (optional)

The string value of the subject parameter is a free formed JSON string with no constrained syntax.

4.1.6. redacted

A redacted vCon **SHOULD** provide a reference to the unredacted or prior, less redacted, vCon instance version of itself. The purpose of the Redacted Object is to provide the reference to the unredacted or less redacted version of the vCon from which this vCon was derived. For privacy reasons, it may be necessary to redact a vCon to construct another vCon without the PII. This allows the non-PII portion of the vCon to still be analyzed or used in a broader scope. The Redacted Object **SHOULD** contain the uuid parameter and **MAY** include the vCon inline via the body and encoding parameters or alternatively the url, alg and signature parameters (see [Inline Files](#) ([Section 2.3](#)))

and [Externally Referenced Files](#) (Section 2.4)). If the unredacted vCon is included in the body, the unredacted vCon **MUST** be in the encrypted form. If a reference to the unredacted vCon is provided in the url parameter, the access to that URL **MUST** be restricted to only those who should be allowed to see the identity or PII for the redacted vCon.

The method(s) for redaction of text, audio and video can be done with existing post processing of media. The method of redaction is out of scope of this document. The assurance of the accuracy of the redaction is made by the entity that creates the redaction which **SHOULD** sign the redacted version of the vCon.

All data and parameters in the prior, less redacted, vCon instance version are either:

- *Removed entirely in the redacted version

- *Copied and partially redacted

- *Copied as is

Data which is to be completely removed from the redacted version, that is contained in a JSON array in the unredacted vCon, **SHOULD** create an empty placeholder such that object array indices do not change for the rest of the elements of the array.

- *redacted: "Redacted" (optional, mutually exclusive with appended and group parameters)

A Redacted Object contains the following parameters:

- *uuid: "String"

The value contains the [uuid string value](#) (Section 4.1.2) of the unredacted/prior vCon instance version. The absence of a value for uuid indicates that the less redacted version of this vCon is not available or does not exist.

- *type: "String"

The value of the redacted type parameter is used to indicate the type of redaction that was performed on this vCon relative to the less redacted version referenced by the redacted uuid parameter. This should indicate the type of information that was redacted.

As defined in [Inline Files](#) (Section 2.3) body and encoding **MAY** be included:

- *body: "String"

- *encoding: "String"

Alternatively, as defined in [Externally Referenced Files](#) ([Section 2.4](#)) url, alg and signature **MAY** be included:

```
*url: "String"

*alg: "String"

*signature: "String"
```

The following diagram illustrates an example partial JSON object tree for a redacted vCon. The top level object is a JWS signed vCon which contains a vCon in the unsigned form in the payload parameter. The second level object is the redacted vcon which refers to the encrypted unredacted vCon in it's redacted parameter. Note that the redacted vCon references the JWE encrypted vCon by UUID and may reference it by URL or direct inclusion. The JWE encrypted unredacted vCon contains the signed version of the unredacted vCon in the ciphertext parameter. The signed unredacted vCon contains the unredacted vCon in the unsigned form in it's payload parameter.

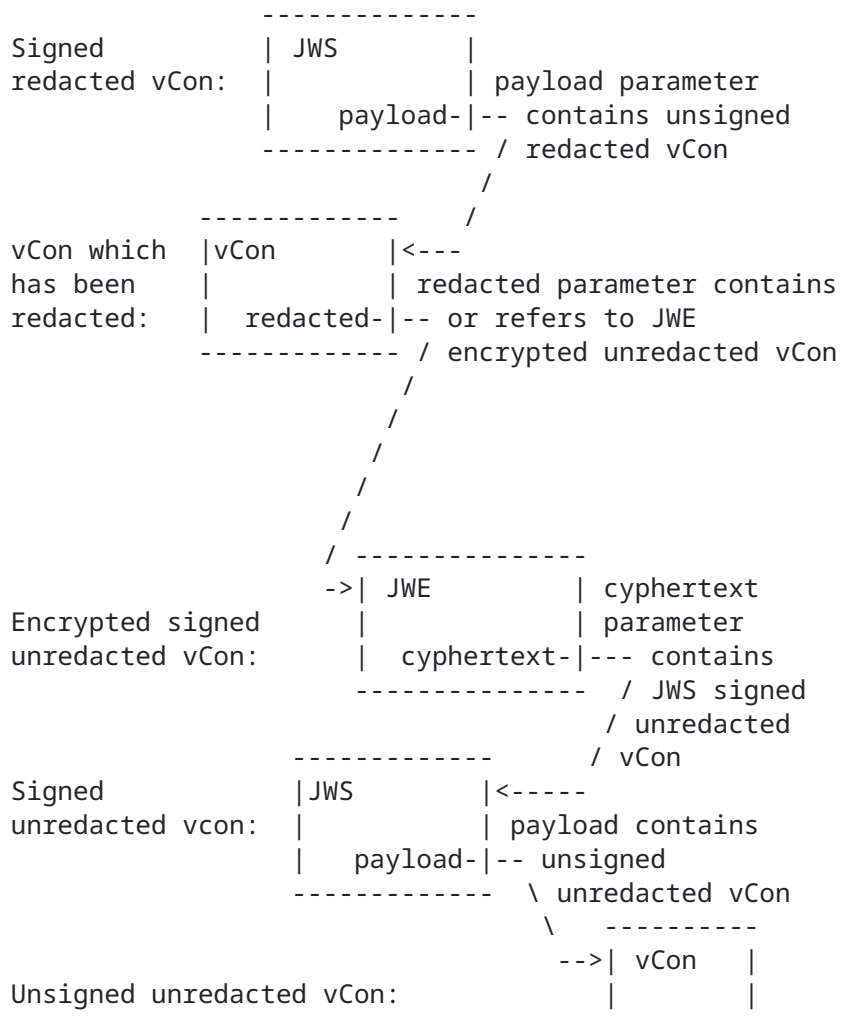


Figure 1: redacted vCon object tree

4.1.7. appended

A signed or encrypted vCon cannot be modified without invalidating it. In these cases, to allow for adding of additional information a new vCon instance version **MUST** be created. The prior vCon instance version is referenced by the Appended Object. Then the appended information is added to the new vCon instance version (i.e. top level vCon object).

The prior vCon instance version **SHOULD** be referenced via the uuid of the prior vCon instance version, and **MAY** include the body and encoding parameters or alternatively the url, alg and signature parameters (see [Inline Files \(Section 2.3\)](#) and [Externally Referenced Files \(Section 2.4\)](#)).

*appended: "Appended" (optional, mutually exclusive with redacted and group parameters)

The Appended Object contains the following parameters:

*uuid: "String" (optional if inline or external reference provided)

The value contains the [uuid string value \(Section 4.1.2\)](#) of the unredacted/original vCon instance version.

Alternatively, as defined in [Inline Files \(Section 2.3\)](#) body and encoding **MAY** be included:

*body: "String"

*encoding: "String"

Alternatively, as defined in [Externally Referenced Files \(Section 2.4\)](#) url, alg and signature **MAY** be included:

*url: "String"

*alg: "String"

*signature: "String"

The following figure illustrates an example partial JSON object tree for an appended vCon. The top level object is the JWS signed appended vCon which contains the unsigned form of the vCon in it's payload parameter. The second level object is the appended vCon with additional conversational data (e.g. analysis data). It refers to its original parent (or prior vCon instance version) of the vCon in its appended parameter. Note: the appended parameter may include the original in the body parameter or refer to it via URL. The appended vCon in this figure refers to the JWS signed version of the vCon,

which in turn contains the original vCon in unsigned form in its payload parameter.

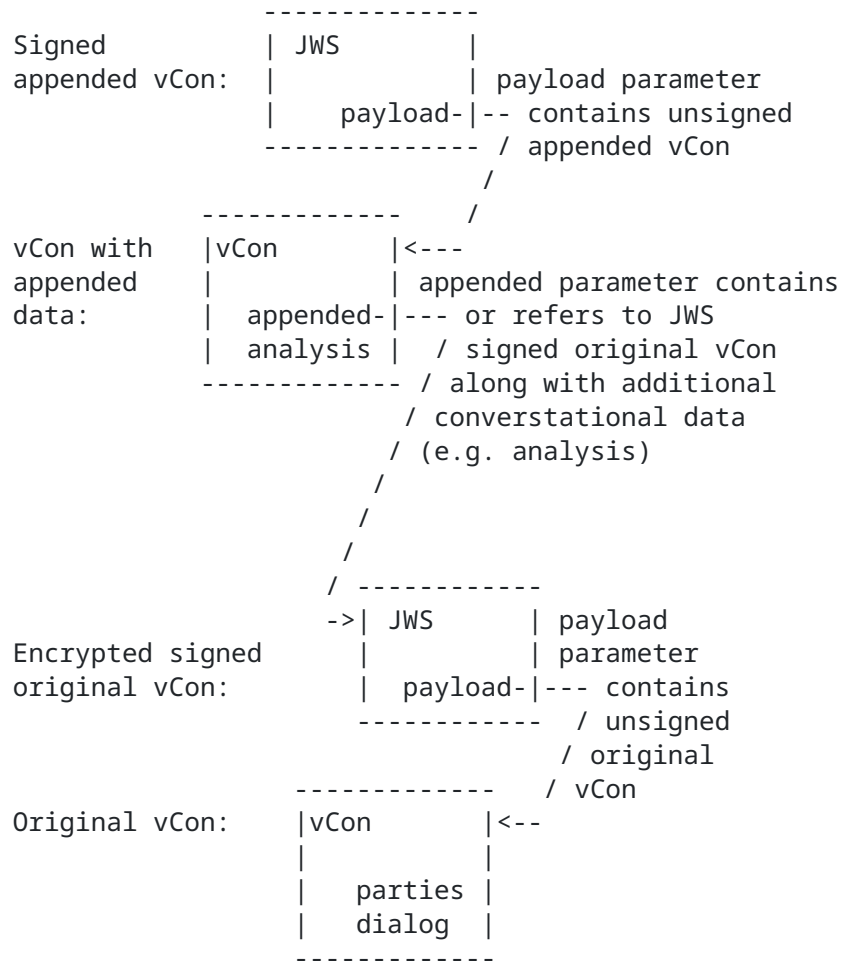


Figure 2: appended vCon object tree

4.1.8. group Objects Array

The scope of a conversation is defined by the observer. It may be any of the following in this non-exhaustive list:

- *a quick text exchange
- *a simple 2-way call
- *an evolving group chat
- *a class lecture and question and answer session
- *a web chat, evolving to a 2 way call, progressing to a transferred 3-way call transitioning to a video conference
- *a series of weekly status calls

In support of these constructs, it may be desirable to aggregate a group of vCons as opposed to including all of the dialog in a single vCon. The conversations may be over heterogeneous or homogeneous medium. A vCon **MAY** aggregated a group of vCon instances in the group array, using a Group Object for each vCon instance.

*group: "Group[]" (optional, mutually exclusive with redacted and appended parameters)

The group array contains a [Group Object](#) ([Section 4.6](#)) for each vCon.

4.1.9. parties Objects Array

The name, identity or contact information of all of the parties involved with the conversation are included in the parties object array. Whether the parties were observers, passive or active participants in the conversation, they each are included as a Party Object in the parties array.

TODO: Should this be a object not an array to make it easier to append parties (i.e. indices of append vCons change when appended)?

*parties: "Party[]"

The value of the parties parameter is an array of [Party Objects](#) ([Section 4.2](#)).

4.1.10. dialog Objects Array

The actual conversation which occurred over text, audio or video that was captured, is contained in the dialog Objects Array.

*dialog: "Dialog[]" (optional)

The value of the dialog parameter is an array of [Dialog Objects](#) ([Section 4.3](#)).

4.1.11. analysis Objects Array

Analysis, which is performed on the conversational data, is stored in the analysis Objects array.

*analysis: "Analysis[]" (optional)

The value of the analysis parameter is an array of [Analysis Objects](#) ([Section 4.4](#)).

4.1.12. attachments Objects Array

Ancillary documents, discussed, presented, referenced or related to the conversation may be stored in the attachments array.

*attachments: "Attachment[]" (optional)

The value of the attachments parameter is an array of [Attachment Objects](#) ([Section 4.5](#)).

4.2. Party Object

4.2.1. tel

If the tel URL for the party is known, it can be included in the tel parameter.

*tel: "String" (optional)

The value of the tel parameter **SHOULD** be a valid [[TEL](#)] URL. The URL scheme prefix (i.e. "tel:") is optional.

4.2.2. stir

If the STIR [[PASSporT](#)] was provided to identify the party, the PASSporT can be included in the stir parameter for the party.

*stir: "String" (optional)

The string value of the stir parameter contains the [[PASSporT](#)] in the JWS Compact Serialization form.

4.2.3. mailto

If the mailto URL is known for the party, it can be included in the mailto parameter.

*mailto: "String" (optional)

The value of the mailto parameter is a string of the format of a valid [[MAILTO](#)] URL. The URL scheme prefix (i.e. "mailto:") is optional.

4.2.4. name

If the party's name is known, it can be included in the name parameter.

*name: "String" (optional)

The string value of the name parameter is a free form JSON string in which part or all of the party's name can be included.

4.2.5. validation

Proof of authorization of the communication channel through STIR, login or possession of a device, is often not sufficient proof of the identity of the person at the other end of the communications channel. It is common in call centers to validate the identity of the person on the communication channel through verification of some sort of personal identification information. The methods used, often varies with the situation and is business practices specific. The purpose of the validation parameter, is to allow the validator to save a label or token which identifies the method of identity validation used to identify the person at the other end of the communication channel. For confidentiality reasons, it **SHOULD NOT** contain the data used to validate the name. However it **MAY** name the data used to validate the name (e.g. "SSN", "DOB", "user ID and password"). It is up to the domain creating the vCon to define the set of tokens or values to be used for the validation parameter.

*validation: "String" (**SHOULD** be provided if name parameter is provided)

The value of the validation string **MAY** be "none" or enterprise or domain defined token or string values.

4.2.6. jCard

TODO: Do we want to support including a jCard for the party?

4.2.7. gmlpos

If the geolocation of the party is known, it can be added in the gmlpos parameter. The gmlpos parameter contains the latitude and longitude of the location of the party at the time of the conversation start.

*gmlpos: "String" (optional)

The gmlpos parameter value contains a string of the same format as the gml:pos element defined in section 3.2 of the [[PIDF-LO](#)] PIDF.

4.2.8. civicaddress

The the civicaddress parameter value contains a Civicaddress Object which is optional and contains civic address information about the location for the party.

*civicaddress: "Civicaddress" (optional)

The Civicaddress Object **MAY** contain any or all of the following parameters: country, a1, a2, a3, a4, a5, a6, prd, pod, sts, hno, hns, lmk, loc, flr, nam, pc as defined in section 2.2.1 of [[GEOPRIV](#)]. The values of all of these parameters are of type String. Note that the

parameter names **MUST** be in lower case when contained in the Civicaddress Object even though they are in upper case in [[GEOPRIV](#)].

*country: "String" (optional)

*a1: "String" (optional)

*a2: "String" (optional)

*a3: "String" (optional)

*a4: "String" (optional)

*a5: "String" (optional)

*a6: "String" (optional)

*prd: "String" (optional)

*pod: "String" (optional)

*sts: "String" (optional)

*hno: "String" (optional)

*hns: "String" (optional)

*lmk: "String" (optional)

*loc: "String" (optional)

*flr: "String" (optional)

*nam: "String" (optional)

*pc: "String" (optional)

TODO: Do we need RFC6848 civic address extensions?

TODO: Is there a need for any temporal location? For example should location be an array, each element with a time stamp?

TODO: Do we just specify for the start of the conversation?

4.2.9. timezone

TODO: timezone for the location of the party?

4.2.10. uuid

The uuid is a unique identifier for the participant. In a contact center, this is particularly important for the call agent participant, and must be static across interactions to allow

correlation with the actual agent configuration provisioned into the systems.

*uuid: "String" (optional)

4.2.11. role

The role that the participant played in the conversation. In a call center there are roles: such as: agents, customer, supervisor and specialist. In conferences there are roles: host, cohost, speaker, panelist, participant and other roles. The role parameter provides the ability to label the role that the part played in the conversation.

*role: "String" (optional)

The following values for the role parameter **MAY** be used:

*"agent"

*"customer"

*"supervisor"

*"sme" (for subject mater expert)

*"thirdparty"

Other values for the role parameter **MAY** also be used.

4.2.12. contact_list

In a contact center scenario, the conversation with this party may be part of a larger effort of contacting a group of parties, individually or perhaps in groups. It is sometimes useful to reference the list from which this party was included. The contact_list may be used as a label for foreign key reference to the contact list that this party was on.

*contact_list "String" (optional)

4.3. Dialog Object

The Dialog object references or contains text, audio or video captured from the conversation. Currently two types of dialog objects are defined in this document. One for text media and the other for audio or video recording files.

TODO: Is there other signalling data that we want to capture other than start and duration and the media (e.g. from jabber, sms, mms, email, SIP, etc.)?

4.3.1. type

*type: "String"

The sting **MUST** have the value of either "recording", "text", "transfer" or "incomplete". A dialog of type "recording" has Dialog Content that either contains a body or refers to via url, which is a recording of the video and/or audio of a segment of the conversation. A dialog of type "text" had has Dialog Content that either contains a body or refers to via url, which contains the text from one of the parties for a segment of the conversation. A dialog of type "transfer" does not capture actual conversation exchange, but rather captures operations, parties and relations between dialog segments. A dialog of type "incomplete" or "transfer" **MUST NOT** have Dialog Content. In the "incomplete" case the call or conversation failed to be setup to the point of exchanging any conversation. Incomplete dialogs **MUST** have a disposition parameter which indicates why the call or conversations failed. In the "transfer" case, the conversation is recorded in other dialogs. The Dialog Transfer parameters, are used to show the roles and relationships between the parties and other dialogs as the transfer process occurred.

4.3.2. start

The start parameter contains the date and time for the beginning of the captured piece of dialog. For text it is the time that the party started typing or if not available, then it is the time the text was sent. For audio and video recordings, it is the time which corresponds to the beginning of the recording.

*start: "Date"

4.3.3. duration

The duration parameter contains the duration in seconds of the referenced or included piece of dialog. For text, if known, it is the time duration from when the party started typing to when they completed typing and the text was sent. For recordings, it is the duration of the recording.

*duration: "UnsignedInt" | "UnsignedFloat" (optional)

The value **MUST** be the dialog duration in seconds.

4.3.4. parties

The party(s) which generated the text or recording for this piece of dialog are indicated in the parties parameter.

*parties: "UnsignedInt" | "UnsignedInt[]" | ("UnsignedInt" | "UnsignedInt[]")[]

Single channel recordings should have a parties value of the form: "UnsignedInt" or "UnsignedInt[]" where the integer value or array of integer values are the indices to the Party Object(s) in the parties array that contributed to the mix for the single channel recording. The index for the Party Object **SHOULD** be included even if the indicated party was silent the entire piece of dialog.

Multi-channel recordings **MUST** have a parties value that is an array of the same size as the number of channels in the recording. The values in that array are either an integer or an array of integers which are the indices to the parties that contributed to the mix for the associated channel of the recording. The index for Party Objects **SHOULD** be included even if the party was silent the entire conversation.

It is implied that the first party in the dialog Object parties list, is the originator of the dialog. However, in some situations, it is difficult to impose the constraint that the first channel of a recording is the originator. If ensuring that the first channel and party listed is the originator is not possible, the optional originator parameter indicates the originator party. In other cases, there may be a separate recording file for each party in a conversation, where only one party is recorded per file. In this situation, it is necessary to indicate the originator as the dialog Object parties parameter will contain only one party and may not be the originator.

TODO: For an email thread, To and Cc parties are all passive. Do we just put the sender as the party or do we want to list all of the recipients and by convention the sender is the first party? Note that each dialog/email could have a difference set of recipients.

4.3.5. originator

The originator party for this dialog. For email and text, this is the sender of the text. For audio and video, this is the caller or host of the call or conference. The originator parameter is only provided if the first party of the dialog Object parties list is NOT the originator.

*originator: "UnsignedInt" (optional)

The originator value is the index into the parties Objects Array, to the party that originated the dialog.

4.3.6. mimetype

The media type for the piece of dialog included or referenced is provided in the mimetype parameter. The mimetype parameter **MUST** be provided for inline dialog files and **MUST** be provided if the Content-

Type header in the [\[HTTPS\]](#) response for the externally referenced URL is not provided.

*mimetype: "Mime" (optional for externally referenced files)

The media types **SHOULD** be one of the following strings:

- "text/plain"
- "audio/x-wav"
- "audio/x-mp3"
- "audio/x-mp4"
- "audio/ogg"
- "video/x-mp4"
- "video/ogg"
- "multipart/mixed"

Note: multi-part will also likely include the boundary parameter

4.3.7. filename

It is sometimes useful to preserve the name of the file which originally contained this piece of dialog. This can be done in the filename parameter.

*filename: "String" (optional)

4.3.8. Dialog Content

The Dialog Object **SHOULD** contain the body and encoding parameters or the url, alg and signature parameters for all dialog types other than "incomplete" and "transfer", these parameters **MUST NOT** be present for "incomplete" or "transfer" dialog types (see [Inline Files \(Section 2.3\)](#) and [Externally Referenced Files \(Section 2.4\)](#)).

For inline included dialog:

*body: "String" (optional in an a redacted vCon)

*encoding: "String"

Alternatively, for externally referenced dialog:

*url: "String" (optional in an a redacted vCon)

*alg: "String"

*signature: "String"

4.3.9. disposition

If the dialog type is "incomplete", it must have a disposition parameter. The value of the disposition parameter provides the reason that the "call control" failed. The term: "call control" is used in a loose sense, as there is not always a call involved, to differentiate from a call disposition that an agent may assign to a call to indicate the reason, issue addressed or outcome of a conversation. This latter definition of call disposition is not dialog, but analysis of the conversation and is not included in the dialog portion.

*disposition: "String" (required for incomplete type dialogs, **SHOULD NOT** be present for other dialog types)

The value of the disposition parameter **MUST** be one of the following string:

- "no-answer" - a call or connection was attempted, but no one answered or accepted the connection
- "congestion" - a call or connection was attempted, but was unable to be completed due to system load
- "failed" - a call or connection was attempted, but failed
- "busy" - a call or connection was attempted, but the party was busy with another conversation
- "hung-up" - a call or connection was made, but the party hung-up before any conversation occurred
- "voicemail-no-message" - a call or connection was made, the voicemail system answered, but no message was left

Note: if a message was left with the voicemail system this is no longer an "incomplete" type dialog, it is a "recording" type and the conversation **SHOULD** be included in the Dialog Content.

4.3.10. party_history Objects Array

Participants in a dialog may not all join and leave at the same time. To support the capturing of the information when parties join, drop, go on hold or mute and unmute, the party_history array may be added to the Dialog Object.

*party_history: "Party_History[]" (optional)

4.3.10.1. Party_History Object

The Party_History Object contains the following parameters:

*party: "UnsignedInt"

The index of the party for this event.

*event: "String"

The string token for the event which **MUST** be one of the following:

- "join" - when the party joins the dialog

- "drop" - when the party drops out of the dialog

- "hold" - when the party is put on hold

- "unhold" - when the part is taken off hold

- "mute" - when the party is muted

- "unmute" - when the part is taken off mute

*time: "Date"

4.3.11. Dialog Transfer

A dialog of type "transfer" documents the rolls of three parties and the relationship between 2 or three dialog segments. In a transfer operation, the roles of the three parties to a transfer are defined in [[SIP-XFER](#)] as:

- * Transferee
- * Transferor
- * Transfer Target

There are two or three calls in which the parties are connected:

- * original call
- * consultative call (optional as this call may not get created)
- * target call

To capture the above roles and dialog segments, the following parameters are defined and **SHOULD** be present in the "transfer" type dialog and **MUST NOT** be present in other dialog types.

* transferee: "UnsignedInt"

The value of the transferee parameter is the index into the parties Object array to the party

* transferor: "UnsignedInt"

The value of the transferor parameter is the index into the parties Object array to the party

* transfer-target: "UnsignedInt"

The value of the transfer-target parameter is the index into the parties Object array to the

* original: "UnsignedInt"

The value of the original parameter is the index into the dialogs Object array to the "record"

* consultation: "UnsignedInt" (optional)

The value of the consultation parameter is the index into the dialogs Object array to the "record"

* target-dialog: "UnsignedInt"

The value of the target-dialog parameter is the index into the dialogs Object array to the "record"

A "transfer" type dialog MUST NOT contain the parties, originator, mimetype, filename or Dialog

The "transfer" type dialog only captures the roles, operations and events of the parties and the dialog setup. It does not capture the purpose or reason for the transfer as that is analysis to be captured in the analysis section of the Vcon after the conversation has occurred.

4.3.12. campaign

In a contact center scenario, a dialog may be initiated as part of a campaign or set of dialogs initiated with a common goal or focus or to be handled or treated in a specific way. The campaign parameter is string that may be used as a label or foreign key in reference to an external specification for how the communication is to be initiated, handled or treated. In some case it may be appropriate to attach the campaign data as an Attachment Object.

*campaign: "String" (optional)

4.3.13. interaction_type

*interaction_type "String" (optional)

TODO: add enumerated values from JDR

4.3.14. **interaction_id**

In a contact center scenario, interactions with a party are often labeled with an identifier. In some case the interaction is contained in a single dialog. In others there may be multiple dialogs (e.g. messages or calls) that are all part of a single interaction. There may also be many interactions for a single conversation or vCon. The interaction parameter is used as a label or foreign key in reference to the interaction ID.

*interaction_id "String" (optional)

4.3.15. **skill**

A contact center may service multiple purposes or customers. In this scenario it is important to label the conversation segment or dialog. The agent or automata which services the dialog are required to have a specific skill. To facilitate this in a vCon dialog, the skill parameter is provided. The string values of the skill parameter are contact center specific.

*skill "String" (optional)

4.3.16. **application**

The application parameter is used to capture the application, communication channel or context over which the conversation was held. The conversation mode can be identified by looking at the dialog type. However that does not different between different communication platform service providers or hosting service. For example, the applicaiton parameter can be used to identify the web conference hosting servivce.

*application "String" (optional)

4.4. **Analysis Object**

Analysis is a broad and in some cases developing field. This document does not attempt to suggest a **SHOULD** support list of types. Nor are formats for analysis data defined in this document. That is for research and specifiation outside the scope of this document. For this reason the Analysis Object provides multiple ways to define the media type of the analysis file. If a well known media or mime type is defined, it **SHOULD** be used. For analysis data or files types for which a media type is not defined, the vendor and schema parameters **SHOULD** be used.

4.4.1. **type**

The type parameter is used to label the semantic type of analysis data.

*type: "String"

The string value **SHOULD** be one of the following:

- "summary"
- "transcript"
- "translation"
- "sentiment"
- "tts"

4.4.2. **dialog**

Analysis typically pertains to one or more of the Dialog Objects in the dialog array. The dialog parameter is used to indicate which Dialog Objects this analysis was based upon.

*dialog: "UnsignedInt" | "UnsignedInt[]" (optional only if the analysis was not derived from any of the dialog)

The value of the dialog parameter is the index to the dialog or array of indices to dialogs in the dialog array to which this analysis object corresponds.

4.4.3. **mimetype**

The media type for the included or referenced analysis file is provided in the mimetype parameter.

*mimetype: "Mime" (optional for externally referenced files, if it this is provided in the [[HTTPS](https)] Content-Type header)

The mimetype string contains the media type or [[MIME](https)] type of the analysis file.

4.4.4. **filename**

It is sometimes useful to preserve the name of the file which originally contained this analysis data. This can be done in the filename parameter.

*filename: "String" (optional)

The file name string contains an optional name for the analysis data file referenced in this Analysis Object.

4.4.5. **vendor**

There may not be a IANA registered media type for the file format containing the analysis data. Even if a media type is defined, it is often useful to keep a record of the vendor that produced the software that produced the analysis. Different implementations

perform differently and knowing the implementation can be useful in interpreting the analysis. For this reason, the vendor or product name is provided in the vendor parameter.

*vendor: "String"

The vendor string value contains the vendor or product name of the software which generated this analysis.

4.4.6. product

As the vendor may have more than one product, the product parameter may be used to differentiate it from other products which may have different schemas of analysis data.

*product: "string" (optional)

4.4.7. schema

The same vendor or software product may produce different formats or data for the same analysis. The schema parameter allows the data format, schema or configuration used to generate the analysis to be saved with the included or referenced analysis data.

*schema: "String" (optional)

The schema string contains a token or label for the data format or schema for the analysis data. As the vendor name may not be specific enough to identify the format of the analysis, the schema value is provide to differentiate from potentially multiple data formats for analysis provided by the same vendor or software.

4.4.8. Analysis Content

The Analysis Object **SHOULD** contain the body and encoding parameters or the url, alg and signature parameters (see [Inline Files \(Section 2.3\)](#) and [Externally Referenced Files \(Section 2.4\)](#)).

For inline included analysis:

*body: "String"

*encoding: "String"

Alternatively, for externally referenced analysis:

*url: "String"

*alg: "String"

*signature: "String"

4.5. Attachment Object

Ancillary documents to the conversation are included or referenced in the Attachment Object. There is no constraint on the types files which can be included or referenced. As most modes of communication, that allow the exchange of files, do not constrain the file type, any file type may be included here.

4.5.1. type or purpose

TODO: Do we want a semantic type like: contract or presentation? Or a subject or title.

4.5.2. start

The start parameter contains the date and time that the Attachment Object was sent/exchanged.

*start: "Date"

4.5.3. party

In most conversations, ancillary documents originate from one of the parties to the conversation. This is not necessarily the author, but the person who distributed the document. This party is identified by the party parameter in the Attachment Object.

*party: "UnsignedInt"

The value of the party parameter is the index into the Parties Object array to the party that contributed the attachment.

4.5.4. mimetype

The media type for the included or referenced attachment file is provided in the mimetype parameter.

*mimetype: "Mime" (optional for externally referenced files, if it this is provided in the [[HTTPS](https)] Content-Type header)

The mimetype string contains the media type or [[MIME](https)] type of the attached file.

4.5.5. filename

It is sometimes useful to preserve the name of the file which originally contained this attachment file. This can be done in the filename parameter.

*filename: "String" (optional)

The file name string contains an optional name for the attachment file referenced in this Attachment Object.

4.5.6. Attachment Content

The Attachment Object **SHOULD** contain the body and encoding parameters or the url, alg and signature parameters (see [Inline Files \(Section 2.3\)](#) and [Externally Referenced Files \(Section 2.4\)](#)).

For inline included attachments:

*body: "String"

*encoding: "String"

Alternatively, for externally referenced attachments:

*url: "String"

*alg: "String"

*signature: "String"

4.6. Group Object

A conversation may have take place using different modes (e.g. web chat which evolves to email, which evolves to phone call, which evolves to video conference). A conversation could take place over several calls (e.g. multiple calls regarding a support incident or problem). Each of these examples might be considered a single conversation event though there are multiple sets of dialog in each. What is considered the boundary of a conversation is a business decision. There are situations in the above example, where it is desired to treat these as a single conversation, but each set of dialog is created in a single vCon (e.g. each dialog occurred in a separate communication silo or security domain) which gets signed. For this reason, it may be necessary to aggregate the separate vCon into a single vCon which is considered the whole of a conversation. The Group Object includes or refers to a vCon to be aggregated into the whole of a single vCon conversation.

The Group Object **SHOULD** contain the uuid and either the body and encoding parameters or the url, alg and signature parameters (see [Inline Files \(Section 2.3\)](#) and [Externally Referenced Files \(Section 2.4\)](#)). The vCon **MAY** be referenced via UUID:

*uuid: "String"

The value of the uuid parameter, is the [uuid string value \(Section 4.1.2\)](#) of the referenced vCon to be aggregated.

The vCon **MAY** be included in line as the value of the body parameter. The encoding parameter **MUST** be included with the body parameter, if provided, to describe the encoding of the vCon body.

*body: "vCon"

The JSON unsigned form of the vCon, the JWS signed form of the vCon or the JWE encrypted form of the vCon.

*encoding: "String"

The encoding string **MUST** have the value: "json".

Alternatively, the vCon can be externally referenced. The url, alg and signature parameters and values are defined in [Externally Referenced Files](#) ([Section 2.4](#)).

*url: "String"

*alg: "String"

*signature: "String"

5. Security Considerations

The security concerns for vCons can put into two categories: making the conversation immutable through integrity verification and protecting the confidentiality of privacy of the parties to the conversation and/or their PII. These requirements along with need to evolve a vCon (e.g. adding analysis, translations and transcriptions) conflict in some ways. To enable this, multiple versions of a vCon may be created. Versions of a vCon may add information (e.g. analysis added to a prior vCon referenced by the appended ([Section 4.1.7](#))) and versions that remove information (e.g. redactions of privacy information removed from the vCon referenced in the redacted ([Section 4.1.6](#))). Redactions may be at different levels for example:

*PII masked to remove PII data in the text, audio, video or transcripts

*De-identified to remove segments or whole recordings that might be used for voice printing or facial recognition

Different parts and versions of a vCon may be created in different security domains over a period of time. In addition, some conversation data may be referenced externally through an HTTPS URL as opposed to completely contained within the vCon. Typically a conversation of one mode, will be hosted or observed in a single domain. This will likely fall into one of the following hosting situations:

*Enterprise Hosted Communications

*Software as a Service (SaaS) Hosted Communications

*Service Provider Hosted Communications

The distinction among these has gotten clouded over recent years. The import consideration is that each is a different security domain.

Information about a conversation captured in an enterprise communications system (e.g. meta data and Dialog Object(s) recorded in an IP PBX) is a different security domain from a SaaS transcription service (i.e. an Analysis Object). Before a vCon leaves a security domain, it **SHOULD** be signed to prevent it from being altered. If the new security domain needs to alter it, a new vCon is created with the removed or added data and the prior version is referenced (i.e. via the redacted ([Section 4.1.6](#)) or appended ([Section 4.1.7](#))). See the redacted vCon object tree figure-1 and appended vCon object tree figure-2. If information is redacted for privacy reasons, the vCon referenced in the redacted ([Section 4.1.6](#)), if inline, **SHOULD** be encrypted to protect the privacy information in the unredacted version of the vCon.

The secure storage and access of externally referenced conversation data is considered out of scope from this document. Secure mechanisms for HTTPS access and storage of files are well defined. Identity and credentials for accessing externally stored data will be exchanged out of band from the vCon. The one requirement for externally referenced data from the perspective of this document, is proof of integrity of that data.

Using the above described approach for redaction and appending of data, we can reduce the security operations on a vCon to signing and encryption. Two approaches to signing are needed as we have data, in JSON format, that is contained within the vCon and may have data (typically media and file formats, often binary) not contained, inline in the vCon, that is externally referenced.

Externally referenced data will be "signed" using [[SHA-512](#)] hash which along with the URL of the externally referenced data is included in the vCon. [[SHA-512](#)] was chosen due to the relatively low cost to generate and verify the signature for what could be very large externally referenced media files. As the hash for each externally referenced file is contained in the vCon which will be signed, the chain of authentication is provided via the signature on the vCon itself.

This document specifies the JSON format for vCons. So it seemed the logical solution for signing vCons, is JOSE [[JWS](#)] JSON Serialization and likewise for encrypting vCons is JOSE [[JWE](#)] JSON Serialization. The solutions are well documents, implementations are readily available and tested.

Methods of redaction exist for text, audio and video using post processing of the media. The method of redaction used is out of the scope of this document. A redacted vCon **SHOULD** reference it's non-redacted version. The non-redacted version of the vCon referenced from the redacted vCon **MUST** be encrypted such that only those with permission to view the non-redacted content can decrypt it.

Any time a vCon is shared outside its original security domain, it **SHOULD** be signed and optionally encrypted. Files externally

referenced by a vCon **SHOULD** always be signed with the verification information included in the vCon that references the external file as defined in [Externally Referenced Files \(Section 2.4\)](#) and [Signing Externally Referenced Files \(Section 5.1\)](#). Externally referenced files **SHOULD** only be transported over [\[HTTPS\]](#) and **SHOULD** be access controlled to those who are permitted to read the contents of that non-redacted vCon. vCons transported over non-secure channels such as email **MUST** be in the encrypted form.

5.1. Signing Externally Referenced Files

In some deployments, it is not practical to include all of the file contents of a vCon inline. In support of that, a file may be externally referenced. When external files are referenced, the signature on the vCon does not secure the file contents from modification. For this reason any externally referenced files **SHOULD** also have a signature. vCons use the [\[SHA-512\]](#) hash method for integrity checking of externally referenced file content and include its url, alg and signature in the vCon which are included in the integrity signature for the whole vCon.

After retrieving externally referenced files, before using its content, the payload of the HTTPS request should be verified using the signature parameter value for the hash for the url body using the procedure defined in section 6.3 and 6.4 of [\[SHA-512\]](#).

5.2. Signed Form of vCon Object

A signed vCon uses [\[JWS\]](#) and takes the General JWS JSON Serialization Syntax form as defined in section 7.2.1 of [\[JWS\]](#). The vCon General JWS JSON Serialization **MUST** include x5c or x5u in the unprotected header.

*payload: "String"

The value of the payload is the Base64Url Encoded string containing the unsigned form of the JSON vCon. The general construction of the payload string value is described in section 7.2.1 of [\[JWK\]](#)

*signatures "Signature[]"

The value of signatures is an array of [Signature Objects \(Section 5.2.1\)](#)

5.2.1. Signature Object

The Signature Object **MUST** contain a header, protected and signature parameter as defined in section 7.2.1 of [\[JWS\]](#).

*header: "Header"

The value of header is defined in [Header Object \(Section 5.2.2\)](#)

*protected: "String"

*signature" "String"

5.2.2. Header Object

The Header Object and its contents are defined in section 4 of [[JWS](#)]. The Header Object for a signed vCon **MUST** include the alg and either the x5c or x5u arrays. The x5c or x5u requirement makes the management and use of vCons easier, allowing the certificate chain to be found as the vCon is moved.

*alg: "String"

The string value of alg is defined in section 4.1.1 of [[JWS](#)]. For a signed vCon this value **SHOULD** be "RS256" to maximize interoperability.

*x5c: "String[]" (**MUST** provide x5c or x5u)

The array of string values for x5c are defined in section 4.1.6 of [[JWS](#)].

*x5u: "String" (**MUST** provide x5c or x5u)

The string value of x5u **MUST** contain an [[HTTPS](#)] URL as defined in section 4.1.5 of [[JWS](#)].

*uuid: "String" (**SHOULD** be provided)

The string value of the UUID for the vCon contained in the payload parameter. This is added for convenience to not require verification of the signed vCon to get it's UUID. When the vCon is verified, the value of this uuid parameter **SHOULD** be verified against the UUID in the signed vCon.

TODO: How to deal with expired signatures?

5.3. Encrypted Form of vCon Object

TODO: Check this terminology:

A vCon **MUST** be signed first using JWS as defined in [Signed Form of vCon Object](#) (Section 5.2), then encrypted using JWE as opposed to just encrypted with integrity protection. The rationale is that meta data and dialog will typically be collected in one security domain, then may be stored or exported to another. The signing is likely for the lifetime of the vCon, where the encryption may be shorter term or domain specific. vCons may be stored in unencrypted form, but the signed form **MUST** be maintained to ensure its integrity.

A encrypted vCon uses [\[JWE\]](#) and takes the General JWE JSON Serialization Syntax form as defined in section 7.2.1 of [\[JWE\]](#).

*unprotected: "Unprotected"

*recipients: "Recipient[]"

*iv: "String"

The string value of iv is the Initialization Vector as constructed as defined in section 7.2.1 of [\[JWE\]](#).

*ciphertext: "String"

The string value of ciphertext is constructed as defined in section 7.2.1 of [\[JWE\]](#) using the signed form of the vCon as the plaintext input for encryption.

*tag: "String"

The string value of tag is the the Authentication Tag as defined in section 7.2.1 of [\[JWE\]](#).

5.3.1. Unprotected Object

*cty: "String"

The string value of cty **SHOULD** be "application/vcon"

*enc: "String"

The string value of enc **SHOULD** be "A256CBC-HS512"

*uuid: "String" (**SHOULD** be provided)

The string value of the UUID for the vCon contained in the ciphertext parameter. This is provided for identification of the encrypted vCon without the need of the key to decrypt the vCon. The value of this uuid parameter **SHOULD** be verified when the vCon is decrypted.

5.3.2. Recipient Object

*header: "Header"

*encrypted_key: "String"

The string value of encrypted_key is defined in section 7.2.1 of [\[JWE\]](#).

5.3.3. Header Object

*alg: "String"

The string value of alg **SHOULD** be "RSA-OAEP".

6. IANA Considerations

This section includes the information required for IANA to register the application/vcon media type per [MEDIATYPE].

Type name: application

Subtype name: vcon+json

Required parameters: N/A

Optional parameters: N/A; unrecognized parameters should be ignored.

Encoding considerations: [JSON]

Additional information:

Security considerations: See Security Considerations section of this document.

Interoperability considerations:

Published specification: [VCON], this document

Applications that use this media type:

Fragment identifier considerations:

Additional Information:

Deprecated alias names for this type: N/A

Magic number(s): N/A

File extension(s): "vcon"

Macintosh file type code(s): N/A

Windows Clipboard Name: VCON

Author: See the Author's Addresses section of this document.

Change controller: IETF

TODO: what is needed for gzip compression?? TODO: do we need mediatypes for JWS and JWE forms of vCon??

7. References

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Appendix A. Contact Center Use Cases

TODO: insert draft-rosenberg-vcon-cc-usecases here

Appendix B. Example vCons

This appendix contains example vCons in the unsigned, signed and encrypted form. The JSON has been indented for readability. Long text lines have been wrapped with a left hand white space indent for readability purposes.

B.1. Two Party Call vCon With Inline Recording

This example vCon is for a simple 2 party PSTN call. It has a single Dialog Object which contains a single channel wav format recording with the two parties audio mixed into the single channel.

```
{
  "vcon": "0.0.1",
  "parties": [
    {
      "tel": "+12345678901",
      "name": "Alice"
    },
    {
      "tel": "+19876543210",
      "name": "Bob"
    }
  ],
  "dialog": [
    {
      "type": "recording",
      "start": "2022-06-21T17:53:26.000+00:00",
      "duration": 4.72,
      "parties": [
        0,
        1
      ],
      "mimetype": "audio/x-wav",
      "filename": "ab_call.wav",
      "encoding": "base64url",
      "body": "UKlGRioeAABXQVZFZm10IBQAAAAxAAEAQB8AAAFkGAABBAAAAAG
        BAAWZhY3QEAAGJMAAGRhdGH2HQAQoxjXHYXCRekuye4gK4TsiV4wZeN
        htuvu3RMkgyPXme4NeahQLG0yeLayx5HCIiRWK7psbQrQTFm57NwQJvIb
        q1aNxk6VpMYAXSm5Bb1rgStIStvEzmCa0Iabxs2gjReJ02Rk0BQt0xHkh
        UTIZd4VGKQoq1KuoCGhrZTx1vRZICuZEcGkGjdH2jiCU1a0NMW6BE8lVHN
        -OYFPHcZspr0CSl1a02h0WUx3CbovpGqKsApWteunk8gMPModynRVFWR
        5o0l2BvaQDcWugGRHrQa9NcEbG1LWQq_AWLpsXKdMQefGrZu4ZE2ZSDIR
        GJLTkpIzDybqSyZishQmjuVGztMKNlcyt2vW546JsutgllpyppQWroAtHb
        kyrrGAX3bIiX8lglSR-oVaBbtKobA08fpJYscQSLHHcGm7hDriuWTRm8A
        6GKQ1Fbcn10M30DcHctnEchwaAI7dxI2knYQC5biNHB2Djxm3bFmyU5TA
        3ALZt3DaSeABIKiRjcm0AxpEkSZI7AEiSJEmSwUYZ1mQLYNu2bdumPWDb
        tm3b9gOAJEmSJFkFgCRJkiQZbHRhTccDtm3btm0qAEaOJEmSPABIKiRjK
        jAASJIKSZLBRhfW9CKAJEmS49gCgCRJkiQ5P2Dbtm3bZgSAJEmSJClkcm
        VNLgBIKiRjkm8ASJIKSZIvAkiSJEm0swM2btu2bcMVmd3kIoDkyJEkyS0
        AJEmS3AgGgCRJkhypC2DjuG3j9mx0WQiyEUQ1DAtyvQJS9aTWwC4KuFqL
        09F4CCJX4yeFkMaSUWSLYMkYinzGa4HzyrEi6-pgHVdXe6mugKzW7VqHY
        OzcDDsXWnJkeVXHFKpuLDZSrAroZ0QohtASpE4dyZSRxozJQC6hJE20LG
        iNYLM1ruIWzsCcRhEW6c3AJhq6bmp9cZ0IvAy2a5xJVcUMNE8Qq3G0CEJ
        y30SNxwrUqUy5NczWkI3S7UCk4iyRBM3AzCvJqkisQPQkcekWjYDoJk4D
        pWiPmUzXCtKFMkuy1g7MtWnrqLwMSqpjR8vXDipSKzk1D-b0jdLzgnQo1
        lapqqCUmjChmctA6jRmYPOLYJtHbatocTAZCfAQ3LHs602zDuCC_LyStA
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        03fhkzJQsvBTCcNk2s-oUx05zpatkETyFn-xtrxRaTR0hZk3WDo5ELiFW
        0q7hmMxgKjdcY0S04Fk7cijHC6EYNXEZI6oDUQz2EeJMMh1orxS0up04u
        UUj0tyjwVQ3HdhpuSRyJv0WzprTo-so7pMpdgKWUk0jlEwjIqBJAawcu5
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        BFEpsm_bjIFPLiJwpRoEoSZEuqWuBJLuu1oxZC8ksQB0Wkt_IqrwaSMq8
        p4mzEPPrFksdx9i9KZVv36AvGkMmyKsHI864U2eThk-iNKRsvgRsqL1vMT
        UHbPK2ZqVvNHw3oEIay3EaN7xJGgV4mmK8Q1k004jHPCFpRzHYxBtb0EZ
```

FMQeMo0VQ2F8GT0Xvh9-qARmv0aH9MYaOpdTIFaS-ZJ040GmZ0vo3fEig
5M8lQvwxfXKhc4QrPGM0pIJthKKkixBYjv1ZJlNwXTlJsw8VWFex6ts
hg7BUiVuU8VoDt1MwRBEkqXknPYWWNFMRtW_FMhsVIpV4RDESZlqtFXHV
I3GSmHZyNFMV24h48qsHAdLYeumkSKhTYG1Qp0LpWhr1UitEmaJ1DxuXw
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2NSFxMuA6htzZ8ougZAbtgLVamHcwpHZgq6B40DSETuvriVpKyFIUpxog
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1pueTN7sLdPY-uiHbuECmzJFAvywh-KivWrRRtmK4u4p1Va666LNhrFMt
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6u0wU-CtiptRtUQohlesWT1X0I4kR-NrCEmIIFRGelq51TpDpN2jnuxFr
UWfaop44Qqkpsix0keSsFwpyiIoHV4IN-NAtFJboRbtIqoILbeS0SJe1i
2_t18Xi4xizaGMTbVg3w4C6biZ8LrTot8bmqK5TWIKQWqUWloIyQhHJaA
MTQaq4SQWNzTeTaoc5MHEkWrWHEY8moxcmLeQkQStoV9lsim7S6HlKE6n
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WTSNDUusYBTn6eN4rWCcrBCVxGDNVEXBCm6R5sZ2KB02buNHk98WyK7DX
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-cSL4MSpGOSs3HCiZxVDdx8hbGiZS5qekUStXiHI5P1o5N0sqA6vpMc_u
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GbeqYB24bSA5bg7XWI0ky2DTiDPkIu6A4WapZRrtoJu8rhnJy4CktZkdm
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QV7IC9NHYYg8yAy-Sq4mduYeU4rsSaXE-dSdsI1MmiVVS8ErZp3kBO5wj
EUZ4litUKh1YLm5QIFtPFgkxBVCWnInXNoIVYldbH66DrRk768I6gWceU
HbhsbZ1MuBLKqaPWZtUSumrm0pKsEkSW8bZx9gzKVdvYjBkIn41UzoBfK
3LyJsuA6kZz3MUuQeU0DhvnbyEcW5bdqWANOuQRdbibYg2RxwykcQtFxu
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mUh5lce5QSPA0VI1y5IjtErKQGbd1vwXM0p1FrtCMZJIdtLS1s6NgKxA
tkKwi3lMgWQ3umtJ7EAdaSMlRayAXbdarDp5LxEpxAgMd4zJkKwMhp4iu
TKzDKaQSk0h3w7Gkde4udP2zowSzGDuZMPuSMvAJU1VLASpG0Socix9s4
DzYfbq0m1N2Si5CDBPTUeN3AyiSASTj_gKQrGctqdxE0QupVatDbeMTdK
KQC0Vhgu562BiGc8kqZSgbmtJFpWswNs2N6N8cTEdLcAIqLKKn2nHDKay
FL-VSAtmrgY5caoKppCbxnRPxkzJ4IxAzLamG0dPweK2jp0WzCAUF4lmu
GuB5PqpZGWxi-Tdu83IKRu58bvpIpTjyo49xVau11B0Pq_Mb1I30pTKhu
LbE-qCpPvr1bMoG5MWofRNa09FTtUULKkcxK1se60u4PnCSpYeriVaxor
WtSTbT3ZK-p8kPe30UiL2Y0mSV6vGnamuo-xkacV8jGIsCdadKA_ipsBK
XQamggPJeduCoXCctcQSaILpxDhsIvSya1mXrwzUetw0g9UKYjCDNMmYF
xWa1G6BBUWGlK_WoJooLVmiBGHikq3T009AEUt8yriBEt1F5gjCrw17l1
gN6E7bRoi2FDau7PaxcRMsvt5Wr9go19VEzaBf2C4UUY5gmjI1SF2MQJU
7ZWVKrUDpFujiln1R4UivHsaQmzSNxgpGtiM9t9kSpn4bzbHvCnaKZmWq
2AfTjebrYBCpdao7zaCoRVZr8-pgwzgwjVDtAJ0mjdkkiRBhRbsKSrXlN
KtbD-aKFDR0cw1Ehiq5jtAIKHooV3bV9lCVdKsge8N14oiuIJm0ccukra
AjR32iF89grKzNdamJcSEltQ7aTZpjxc0KIi1lx5XHCHysPSmv5gx4W20
7Nxf4EFLybMEchVUcy81g-kryZoEsoRzLTe5Iz2DuuJGTo4TWsS7EEqZq
ZPWVzwm8cSfnTlMNZnTdrBWqLFR00FhyCwrNsgWL4WwmlaQNfAKyp7a_o
iJiLDOWg3KsAU5ZdmQwsYhsm3Ua6JUbian3EvyU9yIn9BBIfVv4gU81SF
F9pZFK-RRUGcuho3tJyUIEIdS4jUsJZ2ElNbAWKI9ApOJ10yWFL91xwha
ia6MmSbQUVIm9V4avEEEx1c5up0g7a8M1AJlYnF9pUb4H7NrZay2vBJrc2
k2XXIB0rbxGVbEHSTPLkdHVP3SiyFkrSfMuqxxSoUywtl7IK1nkqWR3qF
NigHFmJWfeOTZKu40sYU5RWNWLaxG3QKsxAH0Xr5MYsgRRlrRxdeTFZKP
QOWKXeYsHHFFSV0iuy4xLmktx0iccSTLEdt06UeF2KVM1gajRx2oivgNS
oT9Uo1WEamTim9CohXLnQMbUdBiaxp2WflvGLTgayFeymZpJEhaXJbvJ
bhY-6rEiNo1q35r2NWEeGLEiFZUh7qBmzS6rAtsoEfP2qgIqN07jV62KJ
L5mJ8xvQMxyuSqOmKTZmr0gILnRjZnWLNy3E6apVcqEmXur4e1Ezc0Mhk
FCmGVjYezBbFiQqsRkoZqj4hX5pCtSP8sQhnUaqW1RJSqSngF3q6VIkts
6gbI60vI3h4nQmlz1ozQkau0juIS0Qiw7auE3tEEvYXRszuaB2jJr6u0Y
LyWaxR4Y1iR7T2sS6u4Z3ULmGNjN21t07hS4nJs8rxUoT9HUI6Ds6-5mx
y1BJLdNZmZPgC7IbpV61UCqx7FkV4FwUSi1CpI5kpRt8Agwbx1liMIYg
vVuNbBCKTsXsSQmQeVyYQ0IV2XedKKrSAvabkyS-5gMV0WNe3twGuVgdy
kiZNZtB8MQkvFX_GvDiqZ7Jqx6Qy4kc0YieoUxlCMptKYB1WRQ0_AZunS
7XqsYBZ0kdyUruCy6A2gRc6A21apH0mB9Slu2wbkbbohlVQWuEnhBE2qF
qZQlXpJsBRARZ4qzkyZ5SIjVEHmJknKsq1BI7RtG_eKABbHbKrc7kCkWI
dGQ4GyoUnzCjItYBipvAq8yFbt7WcMKI5j6s3iDkRSmwxGV-c0lub0oNv
Y0poFzYBrV5kx60thYpm17IgtARLGrKsJfdFYkcIUJrr1mHrzCMLzKzV9

xgy6Vh1Hpe0SuDYd125Nm9hzUw-hHj1S3JiNQJ1Ijdu2fWbj2CcZ14pk8
msp48awbTU3Vhr-TrTvKFicJPOjF333KkjyGUaSZTV6aQ3L1U5ro0uwHE
eaE3BkySIiTAB57LYsgZnfdoSZBqHdpK1LJ6nQXJpwFchNZ-vv8xp4cqV
Lqa0cGpW19XayEpCRW4nNE_pKXYuXQZRLUfXLKmFox06kAmxhaUU1Y2rP
QBndZc5KgVBZVccIYtqqta31CDpUHcdw6hTWRcLI1SsKUoKsXoqS1xKR
s q3AEDV1YXdNQVsLcavky2BUuV3TLK2A5BI-god9seFE9A6yU9tW2-oKUq
Z0RZLgCjw5p0125BC4kZnYadDW1I1grKALt9LbprSAbMa1GvUuQSahbhP
JagG1RHEktWixXCXhDOQRDB1SVh0mU7LYCU0RTgM_Q7Y6EtCuUUuyS_a0
ldRNYTI30c12jsDe9orzdy2Bs1qyY11X4TtVsuuqWM4YTasUyMbarHYtE
byJ3Bo12BWYivAUrq0sG1IcSajNGB0aV83iXSa02orMgR1LTvmbqIkV1
bqhycB06edpup4cqVNsBKorPfKk-kQVj4u0b2vFDR71CiSzRK2yQu9bRk
2U5GA74Bmmc-a3Duh2wt710qKId1Ya0RWTkF70pIrx41S3SjKDFAt0q5N
RBOoUKRmaXYWRJGeyNbGFNphZDhQS0eQyWBtYU0ViaKmQ4Ds5tTb0i1hV
D-0bJWqoF3EMeuQZM0kSbIUxka8to7uDEI22iqLLA1GVqU1kdKkUm7juL
HMxtBJwoygoxXHHceqgNI0coPGksAkukX7kCphGrtuXkWBENVIZxI-MSU
nUrAIukf691HJDDYvE0teUQ1Y1V9IUo3mzkVUz6AUTQccy8pgLSQ5BXnL
IBYzmirr7WBhyUVr9WjuHE0rCwhyWueNtw5IbfpWqrgUNnoiaXLDciy50
lvsjtdQkWLAKNekZZirKCnaDVvVu3gHN1VYX3MQLIoSq6KgTCdRPI00I
2jusa2CmbG5uautQ5Ipl3WT64IOLVbW9PQKNcZZ8-A7Dp3pswbQdQ6PYG
NK6HaxUDiVs2AZRn0zRaRUJ1Z6RRI0iThyfYKRI4c0jrxEqgqospuKy04
VZK_1lMokw2JQ2EolrXkqIzAI9wynWjn4FHvUqacrIC0RnZac4WPmUzNE
CZOpSggWw2qbCREedIMNFu0NS7rDCQRm5i0ledUzULLgCLLkIOJzyDaI6
6h0--g3DQI01zLYCJHtJ2biVHHkPYMtKkxqW7hDEp1K9Uh1g6aTE04qTY
AYJ3fXApCBBWS5MWA30SpIoePwJXFTVo2rGAVRlHst8tgbmeSpDZxUJUk
sA6kcd41kuUIso2UtZG9ClrW79RZ6QpmbuLic1b31E2k7CAqw45ki60A4
6rW27Yq4D2fkh0izUDkok4SxYkyWSmyCFauWgc2xgT6dKJu7dAIqpENKQ
bnCDROpEfX1vfUiXK1YHY3fvRXzGD8yJUHCY0A3TJtU4XvgNpMip1KbQ-
VLPQMwoxUJ1rIDDQuKyN5qg5Ek_28smIPSHotx9XY91JF5MxAqi4uJffq
QLS4qSZr12BVG31b7q1gmRdtnJiNcF0kyAqGNkw5KuoOyG3XXJbpCMxxZ
zuZ9A7IjBzXzRQHk4Xi66Ciak0sa9Zak7uQJJmtIBrDQhIZDCCisukrYW
2QUWj1CrhUGrmp9grYb-oYUuwMOGlkzJLUCMht7LzQHpubADSzYJ1ftv4
KrIGVNW4YtUphGyv65IpeYkaXigzfwRxbJK4eUL0suofVTeKhI0V7rVx6
syVN58RFipMWLcXb7Hwa0ool1tVSbRerw1U13_R970Yst2rTUDSHiqJEk
dDB3u8tLXXEZRI3iLUK0JJsq89gTZ4TTUs9wXJSZIUvXR-7sZUYe8uDt1
KkJhPJMc6uUfVsadMGmupEzmqFtXHdstEeH4X3qL6u60i03kZ00fwoy_K
eppGj8RXzk2zV00dWW80n0QTMxLbTfSB8jmdFp02aK1N1K1197XheSYTX
kOLGwR4faduDnqHCOE2_ZLbx6rq35oJe0p26lepuXOWTt7Ie_DmLni4ID
SZom4YzSEtD47tmVUra4GERBpUJACE0Uua5njuKvpK2ddy599W22r4k_U
2rbBguUz2dY6tWrvTZuZr9sdZE7-olVZu1lUrIGj9QIfauaCtaeXRZr4k
fW5H1xb0fr3U2lWqt6s0SaYEyZJEIdkWdSu89fZvqdnrVNRmum_xp2jTn
h2ISAYJiKwN0oNFtnSyD5Eiyw3dPBAY5diql0b9ecXVDBo2Rs63nWNr6t
fuyXTmu8nIabShdNojSNGobq52IxMKBgybmG60GIEX0pUNWh0AA9KxbRY
yBJnluZH2Jc4hI2iigbuXGkTgINqqeKLVUDKTR2dQt6gpWMhzXTRd4B2B
ULCDiSHXDgy8AnTuMqiR0gCsJsYs4tGAjt1WcVdE2SATnCLSKbNhtyAJQ
ciPhaL0Eyo0bWcX0DiZu29hwFntXxIIy4KuVckrtDCD4tGYSHctAFDmNz
VbPQCvDauJGqTgafrCINDGcNGnZR7Zt3PoALxSCUqY0wbyrSHmTIZc"

}

],

"analysis": [],

"attachments": [],

"uuid": "018b4f72-d342-8696-b9a2-279e0d16bc46"

}

B.2. Text Chat vCon

TODO: text vCon example

B.3. Email Thread Multipart vCon

The following is an unsigned form of an vCon for a 2 message email thread between 2 parties. The email messages are multipart MIME message bodies.


```

{
  "vcon": "0.0.1",
  "group": [],
  "parties": [
    {
      "mailto": "b@example.com",
      "name": "Bob"
    },
    {
      "mailto": "a@example.com",
      "name": "Alice"
    }
  ],
  "dialog": [
    {
      "type": "text",
      "start": "2022-09-23T21:44:25.000+00:00",
      "duration": 0,
      "parties": [
        0,
        1
      ],
      "mimetype": "multipart/mixed; \n\tboundary=\"-----_Part_388314_1108189513.1663969465698\"",
      "encoding": "none",
      "body": "-----_Part_388314_1108189513.1663969465698\r\nContent-Type: multipart/alternative;\r\n\tboundary=\"-----_Part_388313_805631480.1663969465697\"\r\n\r\n-----_Part_388313_805631480.1663969465697\r\nContent-Type: text/plain; charset=UTF-8\r\nContent-Transfer-Encoding: 7bit\r\n\r\nAlice:Please find the image attached.\r\n\r\nRegards,Bob\r\n\r\n-----_Part_388313_805631480.1663969465697\r\nContent-Type: text/html; charset=UTF-8\r\nContent-Transfer-Encoding: 7bit\r\n\r\n<html><head></head><body><div class=\"yahoo-style-wrap\" style=\"font-family:Helvetica Neue, Helvetica, Arial, sans-serif;font-size:16px;\"><div dir=\"ltr\" data-setdir=\"false\"><div><div dir=\"ltr\" style=\"font-family: "Helvetica Neue";, Helvetica, Arial, sans-serif; font-size: 16px;\">Alice:</div><div dir=\"ltr\" style=\"font-family: "Helvetica Neue";, Helvetica, Arial, sans-serif; font-size: 16px;\">Please find the image attached.<br></div><div dir=\"ltr\" style=\"font-family: "Helvetica Neue";, Helvetica, Arial, sans-serif; font-size: 16px;\"><br></div><div dir=\"ltr\" style=\"font-family: "Helvetica Neue";, Helvetica, Arial, sans-serif; font-size: 16px;\">Regards,</div><div dir=\"ltr\" style=\"font-family: "Helvetica Neue";, Helvetica, Arial, sans-serif; font-size: 16px;\">Bob</div></div><br></div></body></html>\r\n-----_Part_388313_805631480.1663969465697--\r\n\r\n-----_Part_388314_1108189513.1663969465698\r\nContent-Type: image/png\r\nContent-Transfer-Encoding: base64\r\nContent-Disposition: attachment; filename=\"=?UTF-8?b?c2NyZWVuc2hv

```

```

dC5wbmc=?=\r\nContent-ID: <c4c28087-6fa1-395e-e50f-dcef
d3d6bf96@yahoo.com>\r\n\r\niVBORw0KGgoAAAANSUHEUgAAACYAAA
AeCAIAAADPdvS5AAAAA3NCSVQICAjb4U/gAAAAGXRFWHRT\r\nb2Z0d2F
yZQBnbm9tZS1zY3JlZW5zaG907w0/PgAAALpJREFUSInl1t0NgzAMBOC7
qPvP1gW6Qjdo\r\nj4f0J4qAJI6NR0vniE8+mwCvtzv6imTnyf1K/UclH
UFWjIvaIL3CHCABSPKktJckWfY6zw+sj5dq\r\nISdVizmj2klzTZG2Rm
e7NKgOwY6qPrMcUs+2PqchL14P+oyz+fHx77K5Sv8xyxAyZ0uBaxn/SpC
U\r\n8NxcosAut1Y3NtjVX7UjZlmpgWTSFyvVQPKB16tSqW53bFnKtyyZ
vYT3rSsAWADWA10jseYFfwAA\r\nAABJRU5ErkJggg==\r\n\r\n----
-=_Part_388314_1108189513.1663969465698--\r\n"
},
{
  "type": "text",
  "start": "2022-09-23T21:44:59.000+00:00",
  "duration": 0,
  "parties": [
    1,
    0
  ],
  "mimetype": "multipart/alternative; \n\tboundary=\"-----_Pa
rt_390234_811845464.1663969499935\"",
  "encoding": "none",
  "body": "-----=_Part_390234_811845464.1663969499935\r\nCon
tent-Type: text/plain; charset=UTF-8\r\nContent-Transfer-
Encoding: 7bit\r\n\r\n Hi Bob:Got it. Thanks.\r\n\r\n
On Friday, September 23, 2022, 9:44:40 PM UTC, Bob <b@exa
mple.com> wrote: \r\n\r\n Alice:Please find the image a
ttached.\r\n\r\nRegards,Bob\r\n \r\n-----=_Part_390234_
811845464.1663969499935\r\nContent-Type: text/html; chars
et=UTF-8\r\nContent-Transfer-Encoding: 7bit\r\n\r\n<html>
<head></head><body><div class=\"ydp89e479a0yahoo-style-wr
ap\" style=\"font-family:Helvetica Neue, Helvetica, Arial
, sans-serif;font-size:16px;\"><div></div>\r\n      <di
v><div><div dir=\"ltr\" style=\"font-family: Helvetica Ne
ue, Helvetica, Arial, sans-serif; font-size: 16px;\">Hi B
ob:</div><div dir=\"ltr\" style=\"font-family: Helvetica
Neue, Helvetica, Arial, sans-serif; font-size: 16px;\">Go
t it. Thanks.</div></div><br></div><div><br></div>\r\n
\r\n      </div><div id=\"ydpdc5150a3yahoo_quoted_
4829810715\" class=\"ydpdc5150a3yahoo_quoted\">\r\n
      <div style=\"font-family:'Helvetica Neue', Helvetic
a, Arial, sans-serif;font-size:13px;color:#26282a;\">\r\n
\r\n      <div>\r\n
      On Friday, September 23, 2022, 9:44:40 PM UTC, Bo
b &lt;b@example.com> wrote:\r\n      </div>\r\n
\r\n      <div><br></div>\r\n      <di
v><br></div>\r\n      <div><div id=\"ydpdc5150a
3yiv4578005613\"><div><div style=\"font-family:Helvetica
Neue, Helvetica, Arial, sans-serif;font-size:16px;\" clas
s=\"ydpdc5150a3yiv4578005613yahoo-style-wrap\"><div dir=
\"ltr\"><div><div dir=\"ltr\" style=\"font-family:Helvetic
a, Arial, sans-serif;font-size:16px;\">Alice:</div><div di
r=\"ltr\" style=\"font-family:Helvetica, Arial, sans-ser

```



```
if;font-size:16px;">Please find the image attached.<br><
/div><div dir="ltr" style="font-family:Helvetica, Arial, sans-serif;font-size:16px;"><br></div><div dir="ltr"
" style="font-family:Helvetica, Arial, sans-serif;font-size:16px;">Regards,</div><div dir="ltr" style="font-f
amily:Helvetica, Arial, sans-serif;font-size:16px;">Bob<
/div></div><br></div></div></div></div></div>\r\n
    </div>\r\n        </div></body></html>\r\n-----=_Par
t_390234_811845464.1663969499935--\r\n"
    }
  ],
  "analysis": [],
  "attachments": [],
  "created_at": "2023-10-20T23:36:50.256+00:00",
  "redacted": {},
  "subject": "Account problem",
  "uuid": "018b4f72-df56-82ac-b9a2-279e0d16bc46"
}
```

B.4. Email Thread Text vCon

The following is an unsigned form of an vCon for a 3 message email thread between 2 parties. The email messages are plain text message bodies.

```

{
  "vcon": "0.0.1",
  "group": [],
  "parties": [
    {
      "mailto": "a@example.com",
      "name": "Alice"
    },
    {
      "mailto": "b@example.com",
      "name": "Bob"
    }
  ],
  "dialog": [
    {
      "type": "text",
      "start": "2022-09-23T23:24:59.000+00:00",
      "duration": 0,
      "parties": [
        0,
        1
      ],
      "mimetype": "text/plain",
      "encoding": "none",
      "body": "Hi Bob:\nI just wanted to follow up to see that yo
        ur account is ok now.\n\nRegards,\nAlice\n\n"
    },
    {
      "type": "text",
      "start": "2022-09-23T23:34:32.000+00:00",
      "duration": 0,
      "parties": [
        1,
        0
      ],
      "mimetype": "text/plain; charset=UTF-8",
      "encoding": "none",
      "body": "Hi Alice:\nAll is fine. Thanks.\n\n    On Friday,
        September 23, 2022, 23:24:59 PM UTC, Alice <a@example.com
        > wrote: \n \n Hi Bob:\n I just wanted to follow up to
        see that your account is ok now.\n \n Regards,\n Alic
        e\n"
    },
    {
      "type": "text",
      "start": "2022-09-23T23:38:12.000+00:00",
      "duration": 0,
      "parties": [
        0,
        1
      ],
      "mimetype": "text/plain",
      "encoding": "none",

```

```
    "body": "Awesome!\n\n    On Friday, September 23, 2022, 23:34: PM UTC, Bob <b@example.com> wrote: \n\n    Hi Alice:\n    All is fine. Thanks.\n    \n    On Friday, September 23, 2022, 23:24:59 PM UTC, Alice <a@example.com> wrote: \n    \n    Hi Bob:\n    I just wanted to follow up to see that your account is ok now.\n    \n    Regards,\n    Alice\n"
  },
],
"analysis": [],
"attachments": [],
"created_at": "2023-10-20T23:36:51.450+00:00",
"redacted": {},
"subject": "Account issue followup",
"uuid": "018b4f72-e3fb-8770-b9a2-279e0d16bc46"
}
```

B.5. Two Party Call vCon With Externally Referenced Recording

This example vCon is for a simple 2 party PSTN call. It has a single Dialog Object which reference a single channel wav format recording with the two parties audio mixed into the single channel.

```
{
  "vcon": "0.0.1",
  "parties": [
    {
      "tel": "+12345678901",
      "name": "Alice"
    },
    {
      "tel": "+19876543210",
      "name": "Bob"
    }
  ],
  "dialog": [
    {
      "type": "recording",
      "start": "2022-06-21T17:53:26.000+00:00",
      "duration": 33.12,
      "parties": [
        0,
        1
      ],
      "url": "https://github.com/ietf-wg-vcon/draft-ietf-vcon-vcon-container/raw/refs/heads/main/examples/ab_call.mp3",
      "mimetype": "audio/x-mp3",
      "filename": "ab_call.mp3",
      "signature": "GLy6IPaIUM1GqzZqfIPZlWjaDsNgNvZM0iCONNThnH0a75fhUM6cYzLZ5GynSURREvZwmOh54-2lRRieyj82UQ",
      "alg": "SHA-512"
    }
  ],
  "analysis": [],
  "attachments": [],
  "uuid": "01928d46-fd43-8c6b-b9a2-279e0d16bc46"
}
```

B.6. Two Party Call vCon with Analysis

TODO: fix diarization in transcript

```

{
  "vcon": "0.0.1",
  "parties": [
    {
      "tel": "+12345678901",
      "name": "Alice"
    },
    {
      "tel": "+19876543210",
      "name": "Bob"
    }
  ],
  "dialog": [
    {
      "type": "recording",
      "start": "2022-06-21T17:53:26.000+00:00",
      "duration": 33.12,
      "parties": [
        0,
        1
      ],
      "url": "https://github.com/ietf-wg-vcon/draft-ietf-vcon-vcon-container/raw/refs/heads/main/examples/ab_call.mp3",
      "mimetype": "audio/x-mp3",
      "filename": "ab_call.mp3",
      "signature": "GLy6IPaIUM1GqzZqfIPZlWjaDsNgNvZM0iCONNThnH0a75fhUM6cYzLZ5GynSURREvZwm0h54-2lRRieyj82UQ",
      "alg": "SHA-512"
    }
  ],
  "analysis": [
    {
      "type": "transcript",
      "dialog": 0,
      "body": {
        "metadata": {
          "transaction_key": "deprecated",
          "request_id": "410a0b7e-92e1-4a97-b724-a3ddd71d5706",
          "sha256": "04dc074100461f5082f2a7a286d0161f0e2728025e83c20592aa7ea3724c2933",
          "created": "2024-10-14T23:04:58.518Z",
          "duration": 33.119938,
          "channels": 1,
          "models": [
            "ab6ddbae-6037-49fb-b0ca-0c8cd63849a1"
          ],
          "model_info": {
            "ab6ddbae-6037-49fb-b0ca-0c8cd63849a1": {
              "name": "2-meeting-nova",
              "version": "2024-02-05.12156",
              "arch": "nova-2"
            }
          }
        }
      }
    }
  ]
}

```

```
},
"results": {
  "channels": [
    {
      "alternatives": [
        {
          "transcript": "Hello. This is example.com. My name is Bob. How can I help you? Hi. I'd like to add Fu to my service. Okay. Can you give me your name and phone number so I can look up your account? My name is Alice, and my number is 123-456-7890. Thank you. Okay. I've added 2 to your service. Is there anything else I can help you with? No. Thank you. Goodbye. Goodbye. Have a nice day.",
          "confidence": 1,
          "words": [
            {
              "word": "hello",
              "start": 1.1999999,
              "end": 1.6999999,
              "confidence": 0.99560547,
              "speaker": 0,
              "speaker_confidence": 0.4401191,
              "punctuated_word": "Hello."
            },
            {
              "word": "this",
              "start": 1.92,
              "end": 2.08,
              "confidence": 0.9980469,
              "speaker": 0,
              "speaker_confidence": 0.4401191,
              "punctuated_word": "This"
            },
            {
              "word": "is",
              "start": 2.08,
              "end": 2.3999999,
              "confidence": 0.9892578,
              "speaker": 0,
              "speaker_confidence": 0.4401191,
              "punctuated_word": "is"
            },
            {
              "word": "example.com",
              "start": 2.3999999,
              "end": 2.8999999,
              "confidence": 0.9326172,
              "speaker": 0,
              "speaker_confidence": 0.4401191,
              "punctuated_word": "example.com."
            }
          ]
        }
      ]
    }
  ]
}
```

```
{
  "word": "my",
  "start": 3.28,
  "end": 3.4399998,
  "confidence": 0.99609375,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "My"
},
{
  "word": "name",
  "start": 3.4399998,
  "end": 3.6,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "name"
},
{
  "word": "is",
  "start": 3.6,
  "end": 3.84,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "is"
},
{
  "word": "bob",
  "start": 3.84,
  "end": 4.24,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "Bob."
},
{
  "word": "how",
  "start": 4.24,
  "end": 4.4,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "How"
},
{
  "word": "can",
  "start": 4.4,
  "end": 4.56,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "can"
}
```



```
},
{
  "word": "i",
  "start": 4.56,
  "end": 4.72,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "I"
},
{
  "word": "help",
  "start": 4.72,
  "end": 4.88,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "help"
},
{
  "word": "you",
  "start": 4.88,
  "end": 5.38,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.7117348,
  "punctuated_word": "you?"
},
{
  "word": "hi",
  "start": 5.68,
  "end": 6.18,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "Hi."
},
{
  "word": "i'd",
  "start": 6.24,
  "end": 6.56,
  "confidence": 0.9416504,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "I'd"
},
{
  "word": "like",
  "start": 6.56,
  "end": 6.7999997,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
```

```
"punctuated_word": "like"
},
{
  "word": "to",
  "start": 6.7999997,
  "end": 6.96,
  "confidence": 0.99902344,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "to"
},
{
  "word": "add",
  "start": 6.96,
  "end": 7.3599997,
  "confidence": 0.96972656,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "add"
},
{
  "word": "fu",
  "start": 7.3599997,
  "end": 7.68,
  "confidence": 0.34643555,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "Fu"
},
{
  "word": "to",
  "start": 7.68,
  "end": 7.9199996,
  "confidence": 0.9980469,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "to"
},
{
  "word": "my",
  "start": 7.9199996,
  "end": 8.08,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2953244,
  "punctuated_word": "my"
},
{
  "word": "service",
  "start": 8.08,
  "end": 8.58,
  "confidence": 0.9902344,
  "speaker": 0,
```

```
    "speaker_confidence": 0.2953244,  
    "punctuated_word": "service."  
  },  
  {  
    "word": "okay",  
    "start": 9.12,  
    "end": 9.62,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "Okay."  
  },  
  {  
    "word": "can",  
    "start": 10,  
    "end": 10.24,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "Can"  
  },  
  {  
    "word": "you",  
    "start": 10.24,  
    "end": 10.4,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "you"  
  },  
  {  
    "word": "give",  
    "start": 10.4,  
    "end": 10.639999,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "give"  
  },  
  {  
    "word": "me",  
    "start": 10.639999,  
    "end": 10.719999,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "me"  
  },  
  {  
    "word": "your",  
    "start": 10.719999,  
    "end": 10.96,  
    "confidence": 1,
```

```
    "speaker": 0,  
    "speaker_confidence": 0.68893933,  
    "punctuated_word": "your"  
  },  
  {  
    "word": "name",  
    "start": 10.96,  
    "end": 11.12,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.4418578,  
    "punctuated_word": "name"  
  },  
  {  
    "word": "and",  
    "start": 11.12,  
    "end": 11.28,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.4418578,  
    "punctuated_word": "and"  
  },  
  {  
    "word": "phone",  
    "start": 11.28,  
    "end": 11.5199995,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.4418578,  
    "punctuated_word": "phone"  
  },  
  {  
    "word": "number",  
    "start": 11.5199995,  
    "end": 11.84,  
    "confidence": 1,  
    "speaker": 0,  
    "speaker_confidence": 0.4418578,  
    "punctuated_word": "number"  
  },  
  {  
    "word": "so",  
    "start": 11.84,  
    "end": 12,  
    "confidence": 0.9453125,  
    "speaker": 0,  
    "speaker_confidence": 0.4418578,  
    "punctuated_word": "so"  
  },  
  {  
    "word": "i",  
    "start": 12,  
    "end": 12.08,
```

```
"confidence": 1,
"speaker": 0,
"speaker_confidence": 0.3258028,
"punctuated_word": "I"
},
{
  "word": "can",
  "start": 12.08,
  "end": 12.24,
  "confidence": 0.9980469,
  "speaker": 0,
  "speaker_confidence": 0.3258028,
  "punctuated_word": "can"
},
{
  "word": "look",
  "start": 12.24,
  "end": 12.48,
  "confidence": 0.9980469,
  "speaker": 0,
  "speaker_confidence": 0.3258028,
  "punctuated_word": "look"
},
{
  "word": "up",
  "start": 12.48,
  "end": 12.639999,
  "confidence": 0.9980469,
  "speaker": 0,
  "speaker_confidence": 0.3258028,
  "punctuated_word": "up"
},
{
  "word": "your",
  "start": 12.639999,
  "end": 12.799999,
  "confidence": 0.99902344,
  "speaker": 0,
  "speaker_confidence": 0.3258028,
  "punctuated_word": "your"
},
{
  "word": "account",
  "start": 12.799999,
  "end": 13.299999,
  "confidence": 0.99902344,
  "speaker": 0,
  "speaker_confidence": 0.3258028,
  "punctuated_word": "account?"
},
{
  "word": "my",
  "start": 13.815,
```

```
"end": 13.974999,
"confidence": 1,
"speaker": 0,
"speaker_confidence": 0.34063697,
"punctuated_word": "My"
},
{
  "word": "name",
  "start": 13.974999,
  "end": 14.054999,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.34063697,
  "punctuated_word": "name"
},
{
  "word": "is",
  "start": 14.054999,
  "end": 14.455,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.34063697,
  "punctuated_word": "is"
},
{
  "word": "alice",
  "start": 14.455,
  "end": 14.955,
  "confidence": 0.97802734,
  "speaker": 0,
  "speaker_confidence": 0.34063697,
  "punctuated_word": "Alice,"
},
{
  "word": "and",
  "start": 15.094999,
  "end": 15.335,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.34063697,
  "punctuated_word": "and"
},
{
  "word": "my",
  "start": 15.335,
  "end": 15.495,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.34063697,
  "punctuated_word": "my"
},
{
  "word": "number",
```

```
    "start": 15.495,
    "end": 15.8949995,
    "confidence": 1,
    "speaker": 0,
    "speaker_confidence": 0.34063697,
    "punctuated_word": "number"
  },
  {
    "word": "is",
    "start": 15.8949995,
    "end": 16.395,
    "confidence": 1,
    "speaker": 0,
    "speaker_confidence": 0.34063697,
    "punctuated_word": "is"
  },
  {
    "word": "123-456-7890",
    "start": 16.855,
    "end": 17.355,
    "confidence": 0.9630999,
    "speaker": 0,
    "speaker_confidence": 0.34063697,
    "punctuated_word": "123-456-7890."
  },
  {
    "word": "thank",
    "start": 20.775,
    "end": 20.935,
    "confidence": 1,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "Thank"
  },
  {
    "word": "you",
    "start": 20.935,
    "end": 21.435,
    "confidence": 1,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "you."
  },
  {
    "word": "okay",
    "start": 23.015,
    "end": 23.515,
    "confidence": 0.99902344,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "Okay."
  },
  {
```

```
    "word": "i've",
    "start": 24.134874,
    "end": 24.454874,
    "confidence": 0.9941406,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "I've"
  },
  {
    "word": "added",
    "start": 24.454874,
    "end": 24.854876,
    "confidence": 0.9902344,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "added"
  },
  {
    "word": "2",
    "start": 24.854876,
    "end": 25.014875,
    "confidence": 0.45239258,
    "speaker": 0,
    "speaker_confidence": 0.7406098,
    "punctuated_word": "2"
  },
  {
    "word": "to",
    "start": 25.014875,
    "end": 25.174875,
    "confidence": 0.7583008,
    "speaker": 0,
    "speaker_confidence": 0.59809494,
    "punctuated_word": "to"
  },
  {
    "word": "your",
    "start": 25.174875,
    "end": 25.334875,
    "confidence": 1,
    "speaker": 0,
    "speaker_confidence": 0.59809494,
    "punctuated_word": "your"
  },
  {
    "word": "service",
    "start": 25.334875,
    "end": 25.654875,
    "confidence": 0.99365234,
    "speaker": 0,
    "speaker_confidence": 0.59809494,
    "punctuated_word": "service."
  },
  },
```



```
{
  "word": "is",
  "start": 25.654875,
  "end": 25.814875,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.59809494,
  "punctuated_word": "Is"
},
{
  "word": "there",
  "start": 25.814875,
  "end": 25.974874,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.59809494,
  "punctuated_word": "there"
},
{
  "word": "anything",
  "start": 25.974874,
  "end": 26.294874,
  "confidence": 0.99902344,
  "speaker": 0,
  "speaker_confidence": 0.59809494,
  "punctuated_word": "anything"
},
{
  "word": "else",
  "start": 26.294874,
  "end": 26.534874,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.59809494,
  "punctuated_word": "else"
},
{
  "word": "i",
  "start": 26.534874,
  "end": 26.614876,
  "confidence": 0.6582031,
  "speaker": 0,
  "speaker_confidence": 0.59809494,
  "punctuated_word": "I"
},
{
  "word": "can",
  "start": 26.614876,
  "end": 26.854874,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2911396,
  "punctuated_word": "can"
}
```

```
},
{
  "word": "help",
  "start": 26.854874,
  "end": 27.014875,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2911396,
  "punctuated_word": "help"
},
{
  "word": "you",
  "start": 27.014875,
  "end": 27.174875,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2911396,
  "punctuated_word": "you"
},
{
  "word": "with",
  "start": 27.174875,
  "end": 27.674875,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2911396,
  "punctuated_word": "with?"
},
{
  "word": "no",
  "start": 28.054874,
  "end": 28.454874,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.2911396,
  "punctuated_word": "No."
},
{
  "word": "thank",
  "start": 28.454874,
  "end": 28.774876,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "Thank"
},
{
  "word": "you",
  "start": 28.774876,
  "end": 29.254875,
  "confidence": 1,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
```

```
"punctuated_word": "you."
},
{
  "word": "goodbye",
  "start": 29.254875,
  "end": 29.754875,
  "confidence": 0.9975586,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "Goodbye."
},
{
  "word": "goodbye",
  "start": 30.454874,
  "end": 30.954874,
  "confidence": 0.9995117,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "Goodbye."
},
{
  "word": "have",
  "start": 31.014874,
  "end": 31.254875,
  "confidence": 0.9980469,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "Have"
},
{
  "word": "a",
  "start": 31.254875,
  "end": 31.334875,
  "confidence": 0.9970703,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "a"
},
{
  "word": "nice",
  "start": 31.334875,
  "end": 31.654875,
  "confidence": 0.99902344,
  "speaker": 0,
  "speaker_confidence": 0.69196534,
  "punctuated_word": "nice"
},
{
  "word": "day",
  "start": 31.654875,
  "end": 32.154877,
  "confidence": 0.99902344,
  "speaker": 0,
```

```

        "speaker_confidence": 0.29370594,
        "punctuated_word": "day."
    }
],
"paragraphs": {
    "transcript": "\nSpeaker 0: Hello. This is example.com. My name is Bob. How can I help you? Hi.\n\nI'd like to add Fu to my service . Okay. Can you give me your name and phone number so I can look up your account? My name is Alice, and my number is 123-456-7890 . Thank you.\n\nOkay. I've added 2 to your service. Is there anything else I can help you with? No. Thank you.\n\nGoodbye. Goodbye. Have a nice day.",
    "paragraphs": [
        {
            "sentences": [
                {
                    "text": "Hello.",
                    "start": 1.1999999,
                    "end": 1.6999999
                },
                {
                    "text": "This is example.com.",
                    "start": 1.92,
                    "end": 2.8999999
                },
                {
                    "text": "My name is Bob.",
                    "start": 3.28,
                    "end": 4.24
                },
                {
                    "text": "How can I help you?",
                    "start": 4.24,
                    "end": 5.38
                },
                {
                    "text": "Hi.",
                    "start": 5.68,
                    "end": 6.18
                }
            ],
            "speaker": 0,
            "num_words": 14,
            "start": 1.1999999,
            "end": 6.18
        },
        {
            "sentences": [
                {
                    "text": "I'd like to add Fu to my ser

```

```
        vice.",
        "start": 6.24,
        "end": 8.58
    },
    {
        "text": "Okay.",
        "start": 9.12,
        "end": 9.62
    },
    {
        "text": "Can you give me your name and phone number so I can look up your account?",
        "start": 10,
        "end": 13.299999
    },
    {
        "text": "My name is Alice, and my number is 123-456-7890.",
        "start": 13.815,
        "end": 17.355
    },
    {
        "text": "Thank you.",
        "start": 20.775,
        "end": 21.435
    }
],
"speaker": 0,
"num_words": 36,
"start": 6.24,
"end": 21.435
},
{
    "sentences": [
        {
            "text": "Okay.",
            "start": 23.015,
            "end": 23.515
        },
        {
            "text": "I've added 2 to your service.",
            "start": 24.134874,
            "end": 25.654875
        },
        {
            "text": "Is there anything else I can help you with?",
            "start": 25.654875,
            "end": 27.674875
        }
    ]
}
```

```

        "text": "No.",
        "start": 28.054874,
        "end": 28.454874
    },
    {
        "text": "Thank you.",
        "start": 28.454874,
        "end": 29.254875
    }
],
"speaker": 0,
"num_words": 19,
"start": 23.015,
"end": 29.254875
},
{
    "sentences": [
        {
            "text": "Goodbye.",
            "start": 29.254875,
            "end": 29.754875
        },
        {
            "text": "Goodbye.",
            "start": 30.454874,
            "end": 30.954874
        },
        {
            "text": "Have a nice day.",
            "start": 31.014874,
            "end": 32.154877
        }
    ],
    "speaker": 0,
    "num_words": 6,
    "start": 29.254875,
    "end": 32.154877
}
]
}
]
}
]
}
},
"encoding": "json",
"vendor": "deepgram",
"schema": "deepgram_prerecorded",
"product": "transcription"
}
],
"attachments": [],

```

```
"uuid": "01928d46-fd43-8c6b-b9a2-279e0d16bc46"  
}
```

B.7. Signed vCon

This example vCon is the signed form of the [Two Party Call vCon With Externally Referenced Recording](#) (Appendix B.5) example. The private key used to sign this can be found at:

`https://raw.githubusercontent.com/vcon-dev/vcon/main/certs/fake_grp.key`

The certificate chain is included in the x5c parameter of the header Object.

[illegible]

uLm9yZzCCASIWDQYJKoZIhvcNAQEBBQADgGEPADCCAQoCgGEBAM81
SKie1S78VA0BDc3LflYNSL9phcecmjQs/9P+iqDXSVm3xpoqsZGoL1
7w21aUAxl++F9Z80Tc70URn2qqUCVTYcx3SmgHuYgspEmJsMRor/m
n3HpHr2ajh+26RKgDGPBrtebeH1si8mX15a/ICzHxrUaE2Y/6DZ/2
wGTxrAE4bYA0UaYft5GGSZL6yP6dXg3EJy2bK2cUTdMIZG/Y7Ny1D
3N4V7MBirDd5FU7k6pMbyr3d/xoi8VL8F1mRCf6zxfF0jaMFT0atE
iTp3M0rw6iS08hy0cDFsPJzIcPgXEitUgGPo/NLgeb8ZmL1kg9B2v
MgaanbuZB6i179A4GgDIUCAwEAATANBgkqhkiG9w0BAQsFAA0CAgE
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B.8. Encrypted vCon

This example vCon is the encrypted form of the [Signed vCon](#) ([Appendix B.7](#)) example. The private key to decrypt it can be found at:

`https://raw.githubusercontent.com/vcon-dev/vcon/main/certs/fake_grp.key`

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"unprotected": {
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  "cty": "application/vcon+json",
  "enc": "A256CBC-HS512"
}
}
```

B.9. Redacted vCon

This is an example redaction of the vCon in the example [Two Party Call vCon With Externally Referenced Recording](#) ([Appendix B.5](#)). Most notable is the [Redacted object](#) ([Section 4.1.6](#)) which references the lesser redacted version of this vCon. In addition the **url** parameter has been redacted from the [Dialog Object](#) ([Section 4.3](#)), but the rest of the [Dialog Object](#) ([Section 4.3](#)) was left in the redaction.


```

{
  "vcon": "0.0.1",
  "parties": [
    {
      "name": "Alice"
    },
    {
      "name": "Bob"
    }
  ],
  "dialog": [
    {
      "type": "recording",
      "start": "2022-06-21T17:53:26.000+00:00",
      "duration": 33.12,
      "parties": [
        0,
        1
      ],
      "mimetype": "audio/x-mp3",
      "filename": "ab_call.mp3",
      "signature": "GLy6IPaIUM1GqzZqfIPZlWjaDsNgNvZM0iCONNThnH0a7
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      "alg": "SHA-512"
    }
  ],
  "analysis": [
    {
      "type": "transcript",
      "dialog": 0,
      "body": [
        {
          "parties": 0,
          "start": "2022-06-21T17:53:27.200000+00:00",
          "duration": 4.9800001,
          "text": "Hello. This is {{URL}}. My name is Bob. How
            can I help you? Hi."
        },
        {
          "parties": 0,
          "start": "2022-06-21T17:53:32.240000+00:00",
          "duration": 15.194999999999999,
          "text": "I'd like to add Fu to my service. Okay. Can
            you give me your name and phone number so I can look
            up your account? My name is Alice, and my number is
            {{PHONE_NUMBER}}. Thank you."
        },
        {
          "parties": 0,
          "start": "2022-06-21T17:53:49.015000+00:00",
          "duration": 6.2398749999999998,
          "text": "Okay. I've added 2 to your service. Is there
            anything else I can help you with? No. Thank you."
        }
      ]
    }
  ]
}

```

```
    },
    {
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      "duration": 2.9000020000000006,
      "text": "Goodbye.  Goodbye.  Have a nice day."
    }
  ],
  "encoding": "json",
  "vendor": "CapitalOne",
  "schema": "data_labeler_schema",
  "product": "dataprofiler"
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],
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"redacted": {
  "uuid": "01928d46-fd43-8c6b-b9a2-279e0d16bc46",
  "type": "PII Redaction"
}
}
```

B.10. Appended Signed vCon

TODO: appended vCon example

B.11. vCon Group

TODO: group vCon example

Acknowledgments

*Thank you to Jonathan Rosenberg and Andrew Siciliano for their input to the vCon container requirements in the form of I-D: draft-rosenberg-vcon-cc-usecases.

*Thank you to Rohan Mahy for his help in exploring the CDDL schema and CBOR format for vCon.

Authors' Addresses

Daniel G Petrie
SIPEz LLC

Email: dan.ietf@sipez.com

Thomas McCarthy-Howe
Strolid

Email: thomas.howe@strolid.com