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**A Session Initiation Protocol (SIP) Event Package for Conference
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Abstract

This document defines a conference event package for the Session Initiation Protocol (SIP) Events framework, along with a data format

used in notifications for this package. The conference package allows users to subscribe to a conference URI. Notifications are sent about changes in the membership of this conference and optionally about changes in the state of additional conference components.

Table of Contents

1.	Introduction	5
2.	Terminology	5
3.	Conference Event Package	5
3.1	Event Package Name	5
3.2	SUBSCRIBE Bodies	6
3.3	Subscription Duration	6
3.4	NOTIFY Bodies	6
3.5	Notifier Processing of SUBSCRIBE Requests	7
3.6	Notifier Generation of NOTIFY Requests	7
3.7	Subscriber Processing of NOTIFY Requests	7
3.8	Handling of Forked Requests	8
3.9	Rate of Notifications	8
3.10	State Agents	8
4.	Conference Document	8
4.1	Format	8
4.2	Namespace	8
4.3	Versioning	8
4.4	State and Partial Notifications	9
4.5	Element Keys	9
4.6	Constructing Coherent State Procedure	10
5.	Conference Data	11
5.1	conference-type	11
5.1.1	conference-description of conference-description-type	12
5.1.2	host-info of host-type	12
5.1.3	conference-state of conference-state-type	12
5.1.4	users of users-type	12
5.1.5	sidebars-by-ref of uris-type	12
5.1.6	sidebar-by-val of conference-type	12
5.2	conference-description-type	13
5.2.1	display-text of string type	13
5.2.2	subject of string type	13
5.2.3	free-text of string type	13
5.2.4	keywords of keywords-type	13
5.2.5	conf-uris of uris-type	13
5.2.6	service-uris of uris-type	14
5.2.7	maximum-user-count of user-count-type	14
5.2.8	available-media of conference-media-type	14
5.3	host-type	14
5.3.1	display-text of string type	15

5.3.2	web-page of anyURI type	15
5.3.3	uris of uris-type	15
5.4	conference-state-type	15
5.4.1	user-count of user-count-type	15
5.4.2	active of Boolean type	15
5.4.3	locked of Boolean type	15
5.4.4	active-media of conference-media-type	15
5.5	conference-media-type	16
5.5.1	conference-medium-type	16
5.5.1.1	display-text of string type	16
5.5.1.2	type of string type	16
5.5.1.3	label of string type	17
5.6	user-type	17
5.6.1	display-text of string type	17
5.6.2	associated-aors of anyURI type	17
5.6.3	roles of user-roles-type	17
5.6.4	language of language type	18
5.6.5	cascaded-focus of anyURI type	18
5.6.6	endpoint of endpoint-type	18
5.7	endpoint-type	19
5.7.1	display-text of string type	19
5.7.2	referred of execution-type	19
5.7.3	status of endpoint-status-type	20
5.7.4	joining-method of joining-type	21
5.7.5	joining-info of execution-type	21
5.7.6	disconnection-method of disconnection-type	21
5.7.7	disconnection-info of execution-type	22
5.7.8	media of media-type	22
5.7.9	call-info of call-type	22
5.7.10	media-type	23
5.7.10.1	display-text of string type	23
5.7.10.2	type of string type	23
5.7.10.3	label of string type	23
5.7.10.4	src-id of string type	24
5.7.10.5	status of media-status-type	24
6.	XML Schema	24
7.	Examples	32
7.1	Basic Example	32
7.2	Rich Example	34
8.	Security Considerations	38
9.	IANA Considerations	38
9.1	conference Event Package Registration	38
9.2	application/conference-info+xml MIME Registration	39
9.3	URN Sub-Namespace Registration for urn:iETF:params:xml:ns:conference-info	39
9.4	XML Schema Registration	40
9.5	URI Purposes Sub-registry Establishment	40
10.	Acknowledgements	41

11.	References	41
11.1	Normative References	41
11.2	Informative References	42
	Authors' Addresses	43
	Intellectual Property and Copyright Statements	45

1. Introduction

The Session Initiation Protocol (SIP) [[7](#)]Events Framework [[8](#)] defines general mechanisms for subscribing to, and receiving notifications of, events within SIP networks. It introduces the notion of a package, which is a specific "instantiation" of the events framework for a well-defined set of events. Here, we define an event package for SIP conferences. This package provides the conference notification service as outlined in the SIP conferencing framework [[18](#)]. As described there, subscriptions to a conference URI are routed to the focus that is handling the conference. It acts as the notifier, and provides clients with updates on conference state.

The information provided by this package is comprised of conference identifier(s), conference participants (optionally with their statuses and media description), conference sidebars, conference service URIs, etc.

2. Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC 2119](#) [[1](#)] and indicate requirement levels for compliant implementations.

3. Conference Event Package

The conference event package allows a user to subscribe to a conference. In SIP, conferences are represented by URIs. These URIs route to a SIP user agent, called a focus, that is responsible for ensuring that all users in the conference can communicate with each other, as described in Conferencing Framework [[18](#)]. The focus has sufficient information about the state of the conference to inform subscribers about it.

It is possible that a participant in the conference may in fact be another focus. In order to provide a more complete participant list, the focus MAY subscribe to the conference package of the other focus to discover the participant list in the cascaded conference. This information can then be included in notifications by use of the <cascaded-focus> element as specified by this package.

This section provides the details for defining a SIP-specific event notification package, as specified by [RFC 3265](#) [[8](#)].

3.1 Event Package Name

The name of this event package is "conference". This package name is

carried in the Event and Allow-Events header, as defined in [RFC 3265](#) [8].

3.2 SUBSCRIBE Bodies

A SUBSCRIBE for a conference package MAY contain a body. This body defines a filter to apply to the subscription. Filter documents are not specified in this document, and at the time of writing, are expected to be the subject of future standardization activity.

A SUBSCRIBE for a conference package MAY be sent without a body. This implies the default subscription filtering policy. The default policy is:

- o Notifications are generated every time there is any change in the state of the conference.
- o Notifications do not normally contain full state; rather, they only indicate the state that has changed. The exception is a NOTIFY sent in response to a SUBSCRIBE. These NOTIFYS contain the full state of the information requested by the subscriber.

3.3 Subscription Duration

The default expiration time for a subscription to a conference is one hour. Once the conference ends, all subscriptions to that particular conference are terminated, with a reason of "noresource" as defined in [RFC 3265](#) [8].

3.4 NOTIFY Bodies

As described in [RFC 3265](#) [8], the NOTIFY message will contain bodies that describe the state of the subscribed resource. This body is in a format listed in the Accept header field of the SUBSCRIBE, or a package-specific default if the Accept header field was omitted from the SUBSCRIBE.

In this event package, the body of the notification contains a conference information document. This document describes the state of a conference. All subscribers and notifiers MUST support the "application/conference-info+xml" data format described in [Section 5](#). The subscribe request MAY contain an Accept header field. If no such header field is present, it has a default value of "application/conference-info+xml". If the header field is present, it MUST include "application/conference-info+xml", and MAY include any other types.

Of course, the notifications generated by the server MUST be in one of the formats specified in the Accept header field in the SUBSCRIBE request.

3.5 Notifier Processing of SUBSCRIBE Requests

The conference information contains very sensitive information. Therefore, all subscriptions SHOULD be authenticated and then authorized before approval. Authorization policy is at the discretion of the administrator, as always. However, a few recommendations can be made.

It is RECOMMENDED that all users in the conference be allowed to subscribe to the conference event package.

3.6 Notifier Generation of NOTIFY Requests

Notifications SHOULD be generated for the conference state when a new participant joins (i.e. gets "connected" to) or a participant leaves (i.e. gets "disconnected" from) the conference.

Subject to a local focus policy, additional changes in participants' status, changes in their media types, and other optional information MAY be reported by the focus.

Changes in sidebar rosters SHOULD be reported by the focus to their participants and MAY be reported to others, subject to local policy.

Changes in conference identifiers and service URIs SHOULD be reported by the focus to the Conference package subscribers.

Changes in other conference state information MAY be reported by the focus to the Conference package subscribers.

3.7 Subscriber Processing of NOTIFY Requests

The SIP Events framework expects packages to specify how a subscriber processes NOTIFY requests in any package specific ways, and in particular, how it uses the NOTIFY requests to construct a coherent view of the state of the subscribed resource.

Typically, the NOTIFY for the conference package will only contain information about those users whose state in the conference has changed. To construct a coherent view of the total state of all users, a subscriber to the conference package will need to combine NOTIFYS received over time.

Notifications within this package can convey partial information; that is, they can indicate information about a subset of the state associated with the subscription. This means that an explicit algorithm needs to be defined in order to construct coherent and consistent state. The details of this mechanism are specific to the

particular document type. See [Section 4.6](#) for information on constructing coherent information from an application/conference-info+xml document.

[3.8](#) Handling of Forked Requests

By their nature, the conferences supported by this package are centralized. Therefore, SUBSCRIBE requests for a conference should not generally fork. Users of this package MUST NOT install more than a single subscription as a result of a single SUBSCRIBE request.

[3.9](#) Rate of Notifications

For reasons of congestion control, it is important that the rate of notifications not become excessive. As a result, it is RECOMMENDED that the server doesn't generate notifications for a single subscriber at a rate faster than once every 5 seconds.

[3.10](#) State Agents

Conference state is ideally maintained in the element in which the conference resides. Therefore, the elements that maintain the conference are the ones best suited to handle subscriptions to it. Therefore, the usage of state agents is NOT RECOMMENDED for this package.

[4.](#) Conference Document

[4.1](#) Format

Conference information is an XML document that MUST be well-formed and valid. It MUST be based on Extensible Markup Language (XML) 1.0 and MUST be encoded using UTF-8 [[13](#)].

[4.2](#) Namespace

This specification makes use of XML namespaces for identifying conference information documents and document fragments. The namespace URI for elements defined by this specification is a URN [[2](#)], using the namespace identifier 'ietf' defined by [[5](#)] and extended by [RFC 3688](#) [[14](#)]. This URN is:

urn:ietf:params:xml:ns:conference-info

[4.3](#) Versioning

The conference information is described by a hierarchal XML structure with the root element <conference-info>. The root element is the

only element in the schema that carries meaningful version number for all the elements in the document. The whole conference information is associated with this version number.

The 'version' attribute MUST be included in the root <conference-info> element.

4.4 State and Partial Notifications

All sub-elements in the <conference-info> hierarchal XML structure can be classified in two groups: those that carry relatively small amount of data and those that can potentially carry a lot of data. During partial notifications, the light elements are updated as atomic pieces of data. On the other hand, elements that can carry a substantial amount of data have the general 'state' attribute attached to them. That is in order to support partial notifications for their content.

The 'state' attribute indicates whether the reported information about the element is "full", "partial" or the element is "deleted" from the conference state document. The default value of any 'state' attribute is "full".

A 'state' attribute of a child element in the document MUST adhere to its parent 'state'. It means that if the parent's 'state' is "full", the state of its children MUST be "full". If the parent's 'state' is "partial", the state of its children MAY be either "partial", "full", or "deleted".

4.5 Element Keys

In the context of this specification, the element key is the set of mandatory attributes or sub-elements of the element. The key value MUST be unique for the element among its siblings of the same type.

In a partial notification event it must be possible to uniquely identify each sub-element among others of the same type under a common parent element. In order to achieve this property, all sub-elements, with possible multiple appearances under a common parent (which has the attribute 'state') have keys defined to them.

Below is the list of the elements with their keys as defined by this specification:

- o Elements <conference-info> and <user> use as the key 'entity'
- o Element <endpoint> uses as the key 'entity' and optionally 'call-id'

- o Element <media> uses as the key 'id'
- o Sub-element <entry> of uris-type contained in elements <conf-uris> and <service-uris> uses as the key <uri>
- o Elements <available-media> and <active-media> of conference-media-type use as the key 'id'
- o Elements <maximum-user-count> and <user-count> of count-type use as the key 'role'
- o Sub-element <entry> of conference-type contained in element <sidebars-by-val> uses as the key 'entity'
- o Elements <associated-uris> and <sidebars-by-ref> of uris-type use as the key <uri>

4.6 Constructing Coherent State Procedure

A conference package subscriber locally maintains a local version number, a local element for each element in the schema, and a table for each element with key(s) in the schema.

For first time a NOTIFY with a "full" document is received (as indicated by the value of the 'state' attribute in the <conference-info> element), the conference package subscriber MUST set the local 'version' number to the value of the 'version' attribute from the received <conference-info> and populate local data with the received information.

Each time a new NOTIFY is received, the value of the local version number and the value of the 'version' attribute in the new received document are compared. If the value in the document is equal or less than the local version, the document is discarded without processing.

Otherwise, if the received NOTIFY contains a "full" or "deleted" state, the conference package subscriber MUST set the local 'version' number to the value of the 'version' attribute from the received <conference-info> and replace the local information with the received document. Receiving "deleted" state means that the conference ceased to exist and the subscriber SHOULD terminate the subscription by sending the SUBSCRIBE with Expires = 0.

Otherwise (i.e. if the received NOTIFY contains "partial" state), if the 'version' number in the received document is more than one number higher than the previous local version number, the subscriber MUST generate a refresh request to trigger a full state notification. If the 'version' number in the document is one higher than the local version number, the local version number is increased by one and the document is used to update the local content as described below.

For each sub-element of the <conference-info> element in the received document,

1. If the element contains "full" state, the whole local element content is flushed and repopulated from the document.
2. Otherwise, if the element contains "deleted" state, the whole element MUST be removed from the local content.
3. Otherwise, if the element contains "partial" state:
 - 3.1 For elements with keys, the subscriber compares the keys received in the update with the keys in the local tables.
 - 3.1.1 If a key does not exist in the local table, a row is added, and its content is set to the element information from the update.
 - 3.1.2 Otherwise, if a key of the same value does exist, for each sub-element in the row the algorithm is applied from step 3.2.
 - 3.2 For each atomic element received in the schema, the element is replaced with the new information as a whole. Also, for each non-atomic element received in the schema with either no 'state' attribute included or the state attribute is set to "full", the element is replaced with the new information as a whole.
 - 3.3 For each non-atomic element with the state attribute set to "partial", the algorithm is applied recursively starting from step 3.1.

5. Conference Data

A conference information document begins with the root element tag <conference-info> of conference-type. Sections below describe the complex types composing the hierarchal conference-type. The full XML schema is defined in [Section 6](#).

5.1 conference-type

This type defines the following attributes:

entity: This attribute contains the conference URI that identifies the conference being described in the document.

state: This attribute indicates whether the document contains the whole conference information ("full"), only the information that has changed since the previous document ("partial"), or the conference ceased to exist ("deleted"). For more details see [Section 4](#).

version: This attribute allows the recipient of conference information documents to properly order them and it MUST be included when used in the root <conference-info> element. Version number is a 32 bit monotonically increasing integer scoped within a subscription. A server MUST increment the version number by one for each new partial notification being sent to a subscriber.

The conference-type defines an extendable sequence of child elements. A "full" conference document MUST at least include the following sub-elements: <conference-description>, <conference-state>, and <users>.

The child elements are described in details below:

[5.1.1](#) conference-description of conference-description-type

This element contains conference information that is derived from system conference policies, is set before the conference activation, and is rarely changed during the conference lifetime.

[5.1.2](#) host-info of host-type

This element contains information about the entity that hosts the conference. This information is set before the conference activation, and is rarely changed during the conference lifetime, unless the whole conference is moved to be hosted by another entity.

[5.1.3](#) conference-state of conference-state-type

This element contains the dynamic information about the current state of the conference.

[5.1.4](#) users of users-type

This element can contain an unbounded number of <user> sub-elements of user-type each containing the information about a participant in the conference.

[5.1.5](#) sidebars-by-ref of uris-type

This element contains <entry> sub-elements of uri-type which provide pointers to sidebar information through sidebar URIs. The recipient of the information can then subscribe to sidebar information independently from the main conference package subscription.

[5.1.6](#) sidebar-by-val of conference-type

This element provides sidebar information as a part of the main

conference package information.

[5.2](#) conference-description-type

This type defines the 'state' attribute which can contain the values "full", "partial", or "deleted".

This type defines an extendable sequence of the following child elements:

[5.2.1](#) display-text of string type

This element contains text description of the conference.

[5.2.2](#) subject of string type

This element contains the subject of the conference.

[5.2.3](#) free-text of string type

This element contains free form text about the conference.

[5.2.4](#) keywords of keywords-type

This element contains a list of words that can be used by automatic search engines to better classify the conference.

[5.2.5](#) conf-uris of uris-type

This element contains a set of <entry> sub-elements - each containing the information about an additional conference URI that this conference can be accessed by. The value of the URI is included in the <uri> sub-element and its description MAY be included in the <display-text> sub-element.

The purpose of the URI SHOULD be included in the <purpose> sub-element. The currently defined <purpose> values to be used with the <conf-uris> are:

participation: Indicates that dialing into this URI will bring the party into the conference

streaming: Indicates that "listening" to this URI will provide the conference live content

Future extensions to this schema may define new values and register them with IANA under the registry established by this specification.

Examples of such URIs include sip: / sips: [[7](#)], h323: [[17](#)], and tel:

[16] URIs.

5.2.6 service-uris of uris-type

This element contains a set of <entry> sub-elements - each containing the URI to be used in order to access different services available for the particular conference. The value of the URI is included in the <uri> sub-element and its description MAY be included in the <display-text> sub-element.

The purpose of the URI SHOULD be included in the <purpose> sub-element. The currently defined <purpose> values to be used with the <service-uris> are:

web-page: Indicates the web page containing the additional information about the conference

recording: Indicates the link at which the recorded conference context can be retrieved

event: Indicates the URI to which the subscription to the conference event package needs to be performed

Future extensions to this schema may define new values and register them with IANA under the registry established by this specification.

5.2.7 maximum-user-count of user-count-type

This element, if used, specifies the maximum number of users permitted in the conference and SHOULD include the counter for all participants in the conference in total by populating the attribute 'role' with value "any". Counters for users with specific roles MAY be additionally provided.

5.2.8 available-media of conference-media-type

This element contains information about the media streams with their types available to the participants in the conference. The entries in the <available-media> container are of conference-medium-type and are indexed by attribute 'id'.

5.3 host-type

This type defines the 'state' attribute which can contain the values "full", "partial", or "deleted".

This type defines an extendable sequence of the following child elements:

[5.3.1](#) **display-text of string type**

This element contains display text information about the entity hosting the conference.

[5.3.2](#) **web-page of anyURI type**

This element contains a web page URI about the user hosting the conference.

[5.3.3](#) **uris of uris-type**

The <entity> sub-element contains additional URIs pointing to the conference host.

[5.4](#) **conference-state-type**

This type defines the 'state' attribute which can contain the values "full", "partial", or "deleted".

This type defines an extendable sequence of the following child elements.

[5.4.1](#) **user-count of user-count-type**

This element is used to specify the current number of users in the conference. The number SHOULD be provided for all participants in total by populating the <role> sub-element with value "any". Additionally counters for users with certain roles in the conference MAY be separately provided.

[5.4.2](#) **active of Boolean type**

This element says whether the conference is currently active or not. A conference is active if dialing into one of the <conf-uris> results in successful establishment of a call signaling session between the dialed user and the conference focus.

[5.4.3](#) **locked of Boolean type**

This element contains information about whether the conference is currently locked. In this context, "locked" means that the conference roster can not be added to (although participants may leave or be removed from the conference).

[5.4.4](#) **active-media of conference-media-type**

This element contains information about the media streams being

currently active in the conference, which is a subset of those listed in the <available-media> container. The entries in the <active-media> container are of conference-medium-type and are indexed by attribute 'id'.

Note, that correlation between media streams in both containers is achieved by matching the values of <label> sub-elements element regardless the position of each media entry (i.e. its 'id' value) in the container.

5.5 conference-media-type

This type defines a sequence of <entry> child elements, each of conference-medium-type.

This type defines the 'state' attribute which can contain the values "full", "partial", or "deleted". This attribute indicates whether the element of conference-media-type contains all existing entries ("full"), only the entries that have changed since the previous notification ("partial"), or that the included entries have been deleted from the conference document ("deleted").

This type defines an extendable sequence of the following child elements.

5.5.1 conference-medium-type

This type defines the 'id' attribute, which is the media stream identifier being generated by the notification server such as its value is unique among all entries in the parent container. This attribute is the key to identify media streams in the container. Note, that the entries can be added and deleted on dynamic basis during the conference and the changes being reported in the conference state notifications.

This type defines an extendable sequence of the following child elements.

5.5.1.1 display-text of string type

This element contains the display text for the media stream.

5.5.1.2 type of string type

This element contains the media type of the media stream. The value of this element MUST be one of the values registered for "media" of SDP [3] and its later revision(s).

[5.5.1.3](#) label of string type

The element <label> carries a unique identifier for this stream among all streams in the conference and is assigned by the focus. The value of this element corresponds to the SDP "label" media attribute defined in [\[21\]](#).

[5.6](#) user-type

This type defines the following attributes:

entity: This attribute contains the URI for the user in the conference. This is a logical identifier, which corresponds to the authenticated identity of the participant. The 'entity' attribute MUST be unique in the user element list because it is used as the key in partial notifications about users' state. An anonymous participant in a conference SHOULD be represented by an anonymous URI generated by the focus. For multiple anonymous participants, the focus must ensure that each anonymous URI is unique. The guidelines for generating anonymous URIs in [RFC 3323](#) [\[9\]](#) should be followed. For example,

"Anonymous1" <sip:anonymous1@anonymous.invalid>

could be used for a participant requesting privacy.

state: This attribute indicates whether the document contains the whole conference information ("full"), only the information that has changed since the previous document ("partial"), or the conference ceased to exist ("deleted").

This type defines an extendable sequence of the following child elements.

[5.6.1](#) display-text of string type

This element contains the display text for the user.

[5.6.2](#) associated-aors of anyURI type

This element contains associated URIs of the user. Usually this information will be manually provided by a system administrator showing the logical association between signaling entities otherwise independent.

[5.6.3](#) roles of user-roles-type

This element contains the roles of the user.

[5.6.4](#) language of language type

This element contains the language preference of the user. This information can be automatically learned via call signaling or be manually set per participant.

[5.6.5](#) cascaded-focus of anyURI type

This element contains a conference URI (different from the main conference URI) for users that are connected to the main conference as a result of focus cascading. In accordance with the SIP conferencing framework [\[18\]](#), this package allows for representation of peer-to-peer (i.e. "flat") focus cascading only. The actual cascading graph can not be deduced from the information provided in the package alone. Advanced applications can construct the graph by subscribing to both this package and the Dialog Package [\[19\]](#) of each cascaded focus and correlating the relevant information.

[5.6.6](#) endpoint of endpoint-type

This element contains information about an endpoint of the parent <user>. The <endpoint> element can have unbounded number of appearances for each user participating in the conference.

The first mandatory key 'entity' of an <endpoint> specifies one of the user devices. Potentially, each device can establish multiple call signaling sessions with the conference focus simultaneously. The secondary optional key 'call-id' can be included by the notification server in order to provide status information for each call signaling session of the endpoint individually. Each subscriber MUST be prepared to receive under a <user> multiple <endpoint> elements with the same 'entity' value and different 'call-id' values.

In a conferencing system where authentication is performed per endpoint (rather than per user), a focus is not necessarily aware of the logical association of multiple endpoints under a common user. In this case, the focus would arrange the endpoints as belonging to separate users in the conference document. Note, that typically in this case, a <user> would contain a single <endpoint> with their 'entity' attributes having the same value.

In a different case, due to privacy concerns for a participant, a focus may choose to shield the information about the participant's multiple endpoints from the third-party subscribers. To do so, the focus MAY aggregate the multiple endpoints' information into a single <endpoint> element under the participant's <user>. Note, that in this case the notification server can still include the secondary 'call-id' key and provide the information for each call signaling

session individually.

5.7 endpoint-type

This type defines the following attributes:

entity: The attribute contains the endpoint URI for the user in the conference. In SIP terms, this is the Contact URI or GRUU. The 'entity' attribute MUST be unique in the endpoint element list because it is used as the key in partial notifications about users' endpoints. An endpoint belonging to an anonymous participant in a conference SHOULD be represented by an anonymous URI generated by the focus. For multiple anonymous endpoints, the focus must ensure that each anonymous URI is unique. The guidelines for generating anonymous URIs in [RFC 3323](#) [9] should be followed.

call-id: This attribute is optional and its usage is a subject to the server's policy per subscriber. The value of this attribute is a numeric index, which is unique for each call signaling session of the parent endpoint. This attribute is used when the server needs to provide call signaling information for each signaling session (also known as a call or a dialog) between the endpoint and the focus individually. If 'call-id' is not included, it means that the server chose providing call signaling status of the <endpoint> collectively for (potentially multiple) call signaling sessions between the endpoint and the conference focus.

state: This attribute indicates whether the element contains the whole endpoint information ("full"), only the information that has changed since the previous document ("partial"), or the endpoint has been deleted from the conference ("deleted").

This type defines an extendable sequence of the following child elements.

5.7.1 display-text of string type

This element contains the display text for the endpoint.

5.7.2 referred of execution-type

This element contains information about the user who's action resulted in this endpoint being brought into the conference (e.g. the SIP user identified by this URI sent a REFER to the focus). It can contain the following sub-elements:

when: This element contains the date and time that the endpoint was referred to the conference and SHOULD be expressed in Coordinated Universal Time (UTC) format.

reason: This element contains the reason the endpoint was referred to the conference.

by: This element contains the URI of the entity who caused the endpoint to be referred to the conference.

5.7.3 status of endpoint-status-type

This element contains the status of the endpoint, and can assume the following values:

connected: The endpoint is a participant in the conference. Depending on the media policies, he/she can send and receive media to and from other participants.

disconnected: The endpoint is not a participant in the conference and no active dialog exists between the endpoint and the focus.

on-hold: Active SIP dialog exists between an endpoint and a focus, but endpoint is "on-hold" for this conference, i.e. neither he/she is "hearing" the conference mix, nor is his/her media being mixed in the conference. As an example, the endpoint has asked to join the conference using SIP, but his/her participation is pending based on moderator approval. In the meantime he/she is hearing music-on-hold or some other kind of related content.

muted-via-focus: Active SIP dialog exists between an endpoint and a focus and the endpoint can "listen" to the conference, but endpoint's media is not being mixed into the conference. Note that sometimes a subset of endpoint media streams can be muted by focus (such as poor quality video) while others (such as voice or IM) can still be active. In this case, it is RECOMMENDED that the "aggregated" endpoint connectivity <status> reflects the status of the most active media.

pending: Endpoint is not yet in the session, but it is anticipated that he/she will join in the near future.

alerting: A PSTN ALERTING or SIP 180 Ringing was returned for the outbound call, endpoint is being alerted.

dialing-in: Endpoint is dialing into the conference, not yet in the roster (probably being authenticated).

dialing-out: Focus has dialed out to connect the endpoint to the conference, but the endpoint is not yet in the roster (probably being authenticated).

disconnecting: Focus is in the process of disconnecting endpoint (either DISCONNECT or BYE was sent to the endpoint).

Note that the defined transient statuses (e.g., disconnecting, alerting, etc.) could generate a lot of notifications. Implementations MAY choose not to generate notifications on these to all participants if it will generate too much traffic.

5.7.4 joining-method of joining-type

This element contains method by which the endpoint joined the conference, and can assume the following values:

dialed-in: The endpoint dialed into the conference, i.e. sent INVITE to the focus, which resulted in successful dialog establishment.

dialed-out: The focus has brought the endpoint into the conference by sending a successful INVITE to the endpoint.

focus-owner: The endpoint is the focus for this conference. This status is used only when a participant's UA acts as a conference focus.

5.7.5 joining-info of execution-type

This element contains information about how the endpoint joined and can contain the following sub-elements:

when: This element contains the date and time that the endpoint joined the conference and SHOULD be expressed in Coordinated Universal Time (UTC).

reason: This element contains the reason the endpoint joined the conference.

by: This element contains the URI of the entity who caused the endpoint to join the conference.

5.7.6 disconnection-method of disconnection-type

This element contains method by which the endpoint departed the

conference, and can assume the following values:

departed: The endpoint sent a BYE, thus leaving the conference.

booted: The endpoint was sent a BYE by the focus, booting him/her out of the conference. Alternatively, the endpoint tried to dial into to conference but was rejected by the focus due to local policy.

failed: The server tried to bring the endpoint into the conference, but its attempt to contact the specific endpoint resulted in a non-200 class final response. Alternatively, the endpoint tried to dial into the conference without success due to technical reasons.

[5.7.7](#) **disconnection-info of execution-type**

This element contains information about the endpoint's departure from the conference and can contain the following sub-elements:

when: This element contains the date and time that the endpoint departed the conference and SHOULD be expressed in Coordinated Universal Time (UTC).

reason: This element contains the reason the endpoint departed the conference. When known and meaningful, it is RECOMMENDED to include the information as conveyed/reported by the call signaling in the format defined by [RFC 3326](#) [10]. For example,

```
<reason>Reason: SIP ;cause=415 ;text="Unsupported Media Type"</reason>
```

by: This element contains the URI of the entity who caused the endpoint to depart the conference.

[5.7.8](#) **media of media-type**

This element contains information about a media stream of the endpoint. The element of the media-type can have an unbounded number of appearances in the endpoint-type for each media stream of the endpoint. Note, that if the 'call-id' attribute of the endpoint is not provided by the server, it is possible that the media streams listed under the common endpoint were established by separate signaling sessions (i.e. belong to different "calls" or "dialogs").

[5.7.9](#) **call-info of call-type**

The <call-info> element MAY be used only if the server chose to explicitly identify each signaling session between the endpoint and

the focus by including the 'call-id' attribute as the <endpoint> secondary key.

The <call-info> element is used for providing detailed call signaling information for a call being maintained between the endpoint and the focus. Note, that privacy policies **MUST** be consulted before revealing this information to third-party participants.

The <sip> sub-element contains the SIP dialog identifier of the endpoint's dialog with the focus. The element includes sub-elements <display-text>, <call-id>, <to-tag>, <from-tag>.

In future, the <call-info> element can be expanded to include call signaling protocol information for other protocols besides SIP.

5.7.10 media-type

This type defines the following attributes:

id: The attribute is the media stream identifier being generated by the notification server such as its value is unique in the endpoint context. This attribute is the key to identify media streams which can be added and deleted on dynamic basis during the conference and the changes being reported in the conference state notifications.

state: This attribute indicates whether the element contains the whole media information ("full"), only the information that has changed since the previous notification ("partial"), or that the media element has been deleted from the conference document ("deleted").

This type defines an extendable sequence of the following child elements.

5.7.10.1 display-text of string type

This element contains the display text for the media stream.

5.7.10.2 type of string type

This element contains the media type for the media stream. The value of this element **MUST** be one of the values registered for "media" of SDP [3] and its later revision(s).

5.7.10.3 label of string type

The element <label> carries a unique identifier for this stream among

all streams in the conference and is assigned by the focus. The value of this element corresponds to the SDP "label" media attribute defined in [21].

5.7.10.4 src-id of string type

The <src-id> element, if applicable, carries the information about the actual source of the media. For example, for RTP/RTCP [12] media streams, the value MUST contain the SSRC value generated by the endpoint for the stream it sends.

When an RTP mixer generates a CSRC list according to RTP/RTCP [12], it inserts a list of the SSRC identifiers of the sources that contributed to the generation of a particular packet into the RTP header of that packet. A quote from RFC 3550: "An example application is audio conferencing where a mixer indicates all the talkers whose speech was combined to produce the outgoing packet, allowing the receiver to indicate the current talker, even though all the audio packets contain the same SSRC identifier (that of the mixer)."

If an RTP mixer compliant to the above is used, participants can perform an SSRC to user mapping and identify "a current speaker".

5.7.10.5 status of media-status-type

The element <status> indicates the status in both directions of the media stream and has the values "sendrecv", "sendonly", "recvonly", or "inactive" as defined in SDP [3] and its later revision(s). Note that value specifies the direction from the participant's point of view. For example, a muted participant's stream will have the value of "recvonly".

6. XML Schema

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema targetNamespace="urn:ietf:params:xml:ns:conference-info"
xmlns:tns="urn:ietf:params:xml:ns:conference-info" xmlns:xs="http://www.w3.org/
2001/XMLSchema" xmlns="urn:ietf:params:xml:ns:conference-info"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <!--
    This import brings in the XML language attribute xml:lang
  -->
  <xs:import namespace="http://www.w3.org/XML/1998/namespace"
schemaLocation="http://www.w3.org/2001/03/xml.xsd" />
  <!--
    CONFERENCE ELEMENT
```

```
-->  
<xs:element name="conference-info" type="conference-type"/>  
<!--
```

```
CONFERENCE TYPE
-->
<xs:complexType name="conference-type">
  <xs:sequence>
    <xs:element name="conference-description" type="conference-
description-type" minOccurs="0"/>
    <xs:element name="host-info" type="host-type" minOccurs="0"/>
    <xs:element name="conference-state" type="conference-state-type"
minOccurs="0"/>
    <xs:element name="users" type="users-type" minOccurs="0"/>
    <xs:element name="sidebars-by-ref" type="uris-type" minOccurs="0"/>
    <xs:element name="sidebars-by-val" type="sidebars-by-val-type"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="entity" type="xs:anyURI" use="required"/>
  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:attribute name="version" type="xs:unsignedInt" use="optional"/>
  <xs:anyAttribute namespace="##other"/>
</xs:complexType>
<!--
STATE TYPE
-->
<xs:simpleType name="state-type">
  <xs:restriction base="xs:string">
    <xs:enumeration value="full"/>
    <xs:enumeration value="partial"/>
    <xs:enumeration value="deleted"/>
  </xs:restriction>
</xs:simpleType>
<!--
CONFERENCE DESCRIPTION TYPE
-->
<xs:complexType name="conference-description-type">
  <xs:sequence>
    <xs:element name="display-text" type="xs:string" minOccurs="0"/>
    <xs:element name="subject" type="xs:string" minOccurs="0"/>
    <xs:element name="free-text" type="xs:string" minOccurs="0"/>
    <xs:element name="keywords" type="keywords-type" minOccurs="0"/>
    <xs:element name="conf-uris" type="uris-type" minOccurs="0"/>
    <xs:element name="service-uris" type="uris-type" minOccurs="0"/>
    <xs:element name="maximum-user-count" type="user-count-type"
minOccurs="0"/>
    <xs:element name="available-media" type="conference-media-type"
minOccurs="0"/>
```

```
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
    <xs:anyAttribute namespace="##other"/>
</xs:complexType>
<!--
    HOST TYPE
```



```
-->
<xs:complexType name="host-type">
  <xs:sequence>
    <xs:element name="display-text" type="xs:string" minOccurs="0"/>
    <xs:element name="web-page" type="xs:anyURI" minOccurs="0"/>
    <xs:element name="uris" type="uris-type" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:anyAttribute namespace="##other"/>
</xs:complexType>
<!--
  CONFERENCE STATE TYPE
-->
<xs:complexType name="conference-state-type">
  <xs:sequence>
    <xs:element name="user-count" type="user-count-type" minOccurs="0"/
>
    <xs:element name="active" type="xs:boolean" minOccurs="0"/>
    <xs:element name="locked" type="xs:boolean" minOccurs="0"/>
    <xs:element name="active-media" type="conference-media-type"
minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:anyAttribute namespace="##other"/>
</xs:complexType>
<!--
  CONFERENCE MEDIA TYPE
-->
<xs:complexType name="conference-media-type">

  <xs:sequence>
    <xs:element name="entry" type="conference-medium-type"
maxOccurs="unbounded"/>
  </xs:sequence>

  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:anyAttribute namespace="##other"/>

</xs:complexType>
<!--
```

CONFERENCE MEDIUM TYPE

-->

```
<xs:complexType name="conference-medium-type">
  <xs:sequence>
    <xs:element name="display-text" type="xs:string"/>
    <xs:element name="type" type="xs:string" minOccurs="0"/>
    <xs:element name="label" type="xs:string" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
```

```
        </xs:sequence>
        <xs:attribute name="id" type="xs:nonNegativeInteger" use="required"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>

    <!--
        URIs TYPE
    -->
    <xs:complexType name="uris-type">
        <xs:sequence>
            <xs:element name="entry" type="uri-type" maxOccurs="unbounded"/>
        </xs:sequence>

        <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>
    <!--
        URI TYPE
    -->
    <xs:complexType name="uri-type">
        <xs:sequence>
            <xs:element name="uri" type="xs:anyURI"/>
            <xs:element name="display-text" type="xs:string" minOccurs="0"/>
            <xs:element name="purpose" type="xs:string" minOccurs="0"/>
            <xs:element name="modified" type="execution-type" minOccurs="0"/>
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>

        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>

    <!--
        USER COUNT TYPE
    -->
    <xs:complexType name="user-count-type">
        <xs:sequence>
            <xs:element name="entry" type="count-type" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>
    <!--
        COUNT TYPE
    -->
    <xs:complexType name="count-type">
```

```
<xs:sequence>
  <xs:element name="count" type="xs:nonNegativeInteger"/>
  <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
```

```
        </xs:sequence>
        <xs:attribute name="role" type="xs:string" use="required"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>
    <!--
        KEYWORDS TYPE
    -->
    <xs:simpleType name="keywords-type">
        <xs:list itemType="xs:string"/>
    </xs:simpleType>
    <!--
        USERS TYPE
    -->
    <xs:complexType name="users-type">
        <xs:sequence>
            <xs:element name="user" type="user-type" minOccurs="0"
maxOccurs="unbounded"/>
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>

        </xs:sequence>

        <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>
    <!--
        USER TYPE
    -->
    <xs:complexType name="user-type">
        <xs:sequence>
            <xs:element name="display-text" type="xs:string" minOccurs="0"/>
            <xs:element name="associated-aors" type="uris-type" minOccurs="0"/>
            <xs:element name="roles" type="user-roles-type" minOccurs="0"/>
            <xs:element name="language" type="xs:language" minOccurs="0"/>
            <xs:element name="cascaded-focus" type="xs:anyURI" minOccurs="0"/>
            <xs:element name="endpoint" type="endpoint-type" minOccurs="0"
maxOccurs="unbounded"/>
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>

        <xs:attribute name="entity" type="xs:anyURI"/>
        <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
        <xs:anyAttribute namespace="##other"/>
    </xs:complexType>
    <!--
```

```
USER ROLES TYPE
-->
<xs:complexType name="user-roles-type">
  <xs:sequence>
    <xs:element name="entry" type="xs:string" maxOccurs="unbounded"/>
  </xs:sequence>
```

```
<xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
  ENDPOINT TYPE
-->
<xs:complexType name="endpoint-type">
  <xs:sequence>
    <xs:element name="display-text" type="xs:string" minOccurs="0"/>
    <xs:element name="referred" type="execution-type" minOccurs="0"/>
    <xs:element name="status" type="endpoint-status-type" minOccurs="0"/>
    <xs:element name="joining-method" type="joining-type" minOccurs="0"/>
    <xs:element name="joining-info" type="execution-type" minOccurs="0"/>
    <xs:element name="disconnection-method" type="disconnection-type"
minOccurs="0"/>
    <xs:element name="disconnection-info" type="execution-type"
minOccurs="0"/>
    <xs:element name="media" type="media-type" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="call-info" type="call-type" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>

  <xs:attribute name="entity" type="xs:anyURI"/>
  <xs:attribute name="call-id" type="xs:string" use="optional"/>
  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
  ENDPOINT STATUS TYPE
-->
<xs:simpleType name="endpoint-status-type">
  <xs:restriction base="xs:string">
    <xs:enumeration value="pending"/>
    <xs:enumeration value="dialing-out"/>
    <xs:enumeration value="dialing-in"/>
    <xs:enumeration value="alerting"/>
    <xs:enumeration value="on-hold"/>
    <xs:enumeration value="connected"/>
    <xs:enumeration value="muted-via-focus"/>
    <xs:enumeration value="disconnecting"/>
    <xs:enumeration value="disconnected"/>
  </xs:restriction>
</xs:simpleType>

<!--
  JOINING TYPE
```

```
-->  
<xs:simpleType name="joining-type">  
  <xs:restriction base="xs:string">  
    <xs:enumeration value="dialed-in"/>  
    <xs:enumeration value="dialed-out"/>  
  </xs:restriction>  
</xs:simpleType>
```



```
        <xs:enumeration value="focus-owner"/>
    </xs:restriction>
</xs:simpleType>
<!--
    DISCONNECTION TYPE
-->
<xs:simpleType name="disconnection-type">
    <xs:restriction base="xs:string">
        <xs:enumeration value="departed"/>
        <xs:enumeration value="booted"/>
        <xs:enumeration value="failed"/>
    </xs:restriction>
</xs:simpleType>

<!--
    EXECUTION TYPE
-->
<xs:complexType name="execution-type">
    <xs:sequence>
        <xs:element name="when" type="xs:dateTime" minOccurs="0"/>
        <xs:element name="reason" type="xs:string" minOccurs="0"/>
        <xs:element name="by" type="xs:anyURI" minOccurs="0"/>
    </xs:sequence>

    <xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
    CALL TYPE
-->
<xs:complexType name="call-type">
    <xs:choice>
        <xs:element name="sip" type="sip-dialog-id-type"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:choice>

    <xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
    SIP DIALOG ID TYPE
-->
<xs:complexType name="sip-dialog-id-type">
    <xs:sequence>
        <xs:element name="display-text" type="xs:string" minOccurs="0"/>
        <xs:element name="call-id" type="xs:string"/>
        <xs:element name="from-tag" type="xs:string"/>
    </xs:sequence>
</xs:complexType>
```

```
<xs:element name="to-tag" type="xs:string"/>
```

```
<xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
</xs:sequence>

<xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
  MEDIA TYPE
-->
<xs:complexType name="media-type">
  <xs:sequence>
    <xs:element name="display-text" type="xs:string" minOccurs="0"/>
    <xs:element name="type" type="xs:string" minOccurs="0"/>
    <xs:element name="label" type="xs:string" minOccurs="0"/>
    <xs:element name="src-id" type="xs:string" minOccurs="0"/>
    <xs:element name="status" type="media-status-type" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:string" use="required"/>
  <xs:attribute name="state" type="state-type" use="optional"
default="full"/>
  <xs:anyAttribute namespace="##other"/>
</xs:complexType>

<!--
  MEDIA STATUS TYPE
-->
<xs:simpleType name="media-status-type">
  <xs:restriction base="xs:string">
    <xs:enumeration value="recvonly"/>
    <xs:enumeration value="sendonly"/>
    <xs:enumeration value="sendrecv"/>
    <xs:enumeration value="inactive"/>
  </xs:restriction>
</xs:simpleType>

<!--
  SIDEBARS BY VAL TYPE
-->
<xs:complexType name="sidebars-by-val-type">
  <xs:sequence>
    <xs:element name="entry" type="conference-type" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>

  <xs:attribute name="state" type="state-type" use="optional"
```

```
default="full"/>
    <xs:anyAttribute namespace="##other"/>
</xs:complexType>

</xs:schema>
```

7. Examples

7.1 Basic Example

The following is an example conference information document:

```
<conference-info entity="sips:conf233@example.com" state="partial"
version="5" >
  <!--
    CONFERENCE INFO
  -->
  <conference-description>
    <subject>Agenda: This month's goals</subject>
    <service-uris>
      <entry>
        <uri> http://sharepoint/salesgroup/</uri>
        <purpose>web-page</purpose>
      </entry>
    </service-uris>
  </conference-description>

  <!--
    CONFERENCE STATE
  -->
  <conference-state>
    <user-count>
      <entry role="any">
        <count>33</count>
      </entry>
    </user-count>
    <active-media>
      <entry id="1">
        <display-text>main audio</display-text>
        <type>audio</type>
        <label>34567</label>
      </entry>
    </active-media>
  </conference-state>

  <users>
    <!--
      USER
    -->
    <user entity="sip:bob@example.com" state="full">
      <display-text>Bob Hoskins</display-text>
    </user>
  </users>

  <!--
    ENDPOINTS
```

-->

Rosenberg, et al.

Expires August 24, 2005

[Page 32]

```
<endpoint entity="sip:bob@pc33.example.com">
  <display-text>Bob's Laptop</display-text>
  <status>disconnected</status>
  <disconnection-method>departed</disconnection-method>
  <disconnection-info>
    <when>2005-03-04T20:00:00Z</when>
    <reason>bad voice quality</reason>
    <by>sip:mike@example.com</by>
  </disconnection-info>
  <!--
    MEDIA
  -->
  <media id="1">
    <display-text>main audio</display-text>
    <type>audio</type>
    <label>34567</label>
    <src-id>432424</src-id>

    <status>sendrecv</status>
  </media>
</endpoint>
</user>

<!--
  USER
-->
  <user entity="sip:alice@example.net" state="full">
    <display-text>Alice</display-text>
    <!--
      ENDPOINTS
    -->
    <endpoint entity="sip:4kfk4j392jsu@example.net;grid=433kj4j3u"
call="1">

      <status>connected</status>
      <joining-method>dialed-out</joining-method>
      <joining-info>
        <when>2005-03-04T20:00:00Z</when>
        <by>sip:mike@example.com</by>
      </joining-info>
      <!--
        MEDIA
      -->
      <media id="1">
        <display-text>main audio</display-text>
        <type>audio</type>
        <label>34567</label>
        <src-id>534232</src-id>
        <status>sendrecv</status>
```

</media>

Rosenberg, et al.

Expires August 24, 2005

[Page 33]


```

        </endpoint>

    </user>
</users>

</conference-info>

```

7.2 Rich Example

The following is an example conference information document. In this example of a partial state notification, there are 32 participants in a voice conference. The user Bob has been booted from the conference by Mike due to bad voice quality. Note that there are three sidebars in the conference, two are referenced just by their sidebar URIs and information about the third sidebar is included in this notification. Also note that while this conference offers both audio and video capabilities, only audio is currently in use.

```

<conference-info entity="sips:conf233@example.com" state="partial"
version="5" >
  <!--
    CONFERENCE INFO
  -->
  <conference-description>
    <display-text>Weekly Sales Meeting</display-text>
    <subject>Agenda: This month's goals</subject>
    <free-text>We will start strict on time</free-text>
    <keywords>sales, meeting, weekly</keywords>
    <conf-uris>
      <entry>
        <uri>tel:+18005671234</uri>
        <display-text>TTI Bridge</display-text>
        <purpose>participation</purpose>

      </entry>
      <entry>
        <uri>h323:conf545@h323.example.com</uri>
        <purpose>participation</purpose>

      </entry>
      <entry>
        <uri>http://real.streaming.com/54634/live.ram</uri>
        <purpose>streaming</purpose>

      </entry>

    </conf-uris>
    <service-uris>

```



```
<entry>
  <uri>http://sharepoint/salesgroup/</uri>
  <purpose>web-page</purpose>
</entry>
<entry>
  <uri>http://quicktime.com/54634/recording.mov</uri>
  <display-text>Quicktime</display-text>
  <purpose>recording</purpose>
</entry>
</service-uris>
<maximum-user-count>
  <entry role="any">
    <count>52</count>
  </entry>
  <entry role="participant">
    <count>50</count>
  </entry>
</maximum-user-count>
<available-media>
  <entry id="1">
    <display-text>main audio</display-text>
    <type>audio</type>
    <label>34567</label>
  </entry>
  <entry id="2">
    <display-text>main video</display-text>
    <type>video</type>
    <label>34569</label>
  </entry>
</available-media>
</conference-description>
<!--
  HOST INFO
-->
<host-info>
  <display-text>Sales Host</display-text>
  <web-page>http://sharepoint/salesgroup/hosts/</web-page>
  <uris>
    <entry>
      <uri>sip:sales@example.com</uri>
    </entry>
  </uris>
</host-info>
<!--
  CONFERENCE STATE
-->
<conference-state>
  <user-count>
```



```
<entry role="any">
  <count>33</count>
</entry>
<entry role="participant">
  <count>32</count>
</entry>
</user-count>
<active>true</active>
<locked>>false</locked>

<active-media>
  <entry id="1">
    <type>audio</type>
  </entry>
</active-media>
</conference-state>

<!--
USERS
-->
<users>
  <user entity="sip:bob@example.com">
    <display-text>Bob Hoskins</display-text>
    <associated-aors>
      <entry>
        <uri>mailto:bob@example.com</uri>
        <display-text>email</display-text>
      </entry>
    </associated-aors>
    <roles>
      <entry>participant</entry>
    </roles>
    <language>en</language>

  <!--
  ENDPOINTS
  -->
  <endpoint entity="sip:bob@pc33.example.com" call="1">
    <display-text>Bob's Laptop</display-text>
    <referred>
      <when>2005-03-04T20:00:00Z</when>
      <reason>expert required</reason>
      <by>sip:mike@example.com</by>
    </referred>
    <status>disconnecting</status>
    <joining-method>dialled-out</joining-method>
    <joining-info>
      <when>2005-03-04T20:00:00Z</when>
```



```

method>
    <reason>invitation</reason>
    <by>sip:mike@example.com</by>
</joining-info>
<disconnection-method>booted</disconnection-
method>

    <disconnection-info>
        <when>2005-03-04T20:00:00Z</when>
        <reason>bad voice quality</reason>
        <by>sip:mike@example.com</by>
    </disconnection-info>

<!--
CALL INFO
-->
    <call-info>
        <sip>
            <display-text>full info</display-
text>

            <call-id>hsjh8980vhsb78</call-id>
            <from-tag>vav738dvbs</from-tag>
            <to-tag>8954jggjg8432</to-tag>
        </sip>
    </call-info>

<!--
MEDIA
-->
    <media id="1" state="full">
        <display-text>main audio</display-text>
        <type>audio</type>
        <label>34567</label>
        <src-id>432424</src-id>
        <status>sendrecv</status>
    </media>
</endpoint>
</user>
</users>

<!--
SIDEBARS BY REFERENCE
-->
<sidebars-by-ref>
    <entry>
        <uri>sips:conf233@example.com; grid=45</uri>
        <display-text>sidebar with Carol</display-text>
    </entry>
    <entry>
        <uri>sips:conf233@example.com; grid=21</uri>
        <display-text>private sidebar with Peter</display-text>
    </entry>
</sidebars-by-ref>

```

</sidebars-by-ref>

Rosenberg, et al.

Expires August 24, 2005

[Page 37]


```
<!--
  SIDEBARS BY VALUE
-->
<sidebars-by-val>
  <entry entity="sips:conf233@example.com; grid=77"
state="partial">
    <users>
      <user entity="sip:bob@example.com"
state="partial"></user>
      <user entity="sip:mark@example.com"
state="partial"></user>
      <user entity="sip:dan@example.com"
state="partial"></user>
    </users>
  </entry>
</sidebars-by-val>

</conference-info>
```

8. Security Considerations

Subscriptions to conference state can reveal very sensitive information. For this reason, the document recommends authentication and authorization, and provides guidelines on sensible authorization policies.

Since the data in notifications is sensitive as well, end-to-end SIP encryption mechanisms using S/MIME SHOULD be used to protect it.

Since a focus provides participant identity information using this event package, participant privacy needs to be taken into account. A focus MUST support requests by participants for privacy. Privacy can be indicated by the conference policy - for every participant or select participants. It can also be indicated in the session signaling. In SIP this can be done using the Privacy header field described in [RFC 3323](#) [9]. For a participant requesting privacy, no identity information SHOULD be revealed by the focus such as a URI (e.g. the Address of Record, Contact, or GRUU). For these cases, the anonymous URI generation method outlined in section [Section 5.6](#) of this document MUST be followed.

9. IANA Considerations

This document registers a SIP event package, a new MIME type, application/conference-info+xml, a new XML namespace, a new XML schema, and creates a sub-registry "URI purposes" under the existing registry: <http://www.iana.org/assignments/sip-parameters>.

9.1 conference Event Package Registration

This specification registers an event package, based on the

registration procedures defined in [RFC 3265](#) [8]. The following is the information required for such a registration:

Package Name: conference

Package or Template-Package: This is a package.

Published Document: RFC XXXX (Note to RFC Editor: Please fill in XXXX with the RFC number of this specification).

Person to Contact: Jonathan Rosenberg, jdrosen@jdrosen.net.

9.2 application/conference-info+xml MIME Registration

MIME media type name: application

MIME subtype name: conference-info+xml

Mandatory parameters: none

Optional parameters: Same as charset parameter application/xml as specified in [RFC 3023](#) [6]

Encoding considerations: Same as encoding considerations of application/xml as specified in [RFC 3023](#) [6]

Security considerations: See [Section 10 of RFC 3023](#) [6] and [Section 8](#) of this specification

Interoperability considerations: none

Published specification: This document

Applications which use this media type: This document type has been used to support SIP conferencing applications

Additional Information:

Magic Number: None

File Extension: .cif or .xml

Macintosh file type code: "TEXT"

Personal and email address for further information: Jonathan Rosenberg, [<jdrosen@jdrosen.net>](mailto:jdrosen@jdrosen.net)

Intended usage: COMMON

Author/Change controller: The IETF

9.3 URN Sub-Namespace Registration for urn:ietf:params:xml:ns:conference-info

This section registers a new XML namespace, as per the guidelines in [RFC 3688](#) [14].

URI: The URI for this namespace is

urn:ietf:params:xml:ns:conference-info

Registrant Contact: IETF, SIPING working group, [<sipping@ietf.org>](mailto:sipping@ietf.org), Jonathan Rosenberg [<jdrosen@jdrosen.net>](mailto:jdrosen@jdrosen.net)

XML:


```
BEGIN
<?xml version="1.0"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML Basic 1.0//EN"
    "http://www.w3.org/TR/xhtml-basic/xhtml-basic10.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
  <meta http-equiv="content-type"
    content="text/html; charset=iso-8859-1"/>
  <title>Conference Information Namespace</title>
</head>
<body>
  <h1>Namespace for Conference Information</h1>
  <h2>urn:ietf:params:xml:ns:conference-info</h2>
  <p>See <a href="[[[URL of published RFC]]]">RFCXXXX</a>.</p>
</body>
</html>
END
```

9.4 XML Schema Registration

This specification registers a schema, as per the guidelines in [RFC 3688](#) [14].

URI: please assign

Registrant Contact: IETF, SIPping Working Group

(sipping@ietf.org), Jonathan Rosenberg (jdrosen@jdrosen.net)

XML: The XML can be found as the sole content of [Section 6](#)

9.5 URI Purposes Sub-registry Establishment

This document instructs the IANA to create a new sub-registry "URI purposes" under the already existing registry:

<http://www.iana.org/assignments/sip-parameters>.

The purpose of a URI is an XML element, encoded in the conference event package [RFC XXXX - substitute with the number assigned to this draft]. The value of the <purpose> element indicates the intended usage of the URI in the context of the conference event package and is defined in sections [Section 5.2.5](#) and [Section 5.2.6](#) of this specification.

This sub-registry is defined as a table that contains the following three columns:

Value: The token under registration

Description: A descriptive text defining the intended usage of the URI

Document: A reference to the document defining the registration

This specification instructs IANA to create the table with the initial content as defined below:

Value	Description	Document
-----	-----	-----
participation	The URI can be used to join the conference	[RFC XXXX]
streaming	The URI can be used to access the streamed conference data	[RFC XXXX]
event	The URI can be used to subscribe to the conference event package	[RFC XXXX]
recording	The URI can be used to access the recorded conference data	[RFC XXXX]
web-page	The URI can be used to access a web page that contains additional information of the conference	[RFC XXXX]

New values of the "URI purposes" are registered by the IANA when a specification becomes available and according to the definition of [RFC 2434](#) [4]. The IANA Considerations section of the specification MUST include the following information:

Value: The value of the <purpose> element to be registered

Description: A short description of the intended usage of the URI

[10.](#) Acknowledgements

The authors would like to thank Dan Petrie, Sean Olson, Alan Johnston, Rohan Mahy, Cullen Jennings, Brian Rosen, Roni Even, and Miguel Garcia for their comments and inputs.

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