A RELOAD Usage for Distributed Conference Control (DisCo) – Update
draft-knauf-p2psip-disco-02

Alexander Knauf, Gabriel Hege
Thomas Schmidt, Matthias Wählisch

alexander.knauf@haw-hamburg.de, hege@fhtw-berlin.de,
{t.schmidt,waehlisch}@ieee.org
Agenda

• **Status** of Document

• **Overview** of DisCo – a short reminder

• **Update report** of DisCo

• **Proposal** for Media Negotiation in DisCo

• **Introduction** XML Event Package for Distributed Conferences
Status of Document (1)

• draft version -00: Initially presented at IETF 78 (Maastricht)
  – Several encouraging feedbacks

• draft version -01: Submitted 30. Dec 2010
  – Mechanism for generating chained conference certificates
  – USER-CHAIN-MATCH access policy for shared write access to overlay Resources
  – XML Event Package for Distributed Conferences
  – Media negotiation scheme for DisCo
Status of Document (2)

• draft version -02: Submitted 14 Mar 2011

  – Replaced USER-CHAIN-MATCH policy and chained certificate mechanism

  • No adequate solution for revoking chained certificates

  – Using Access Control Policies of ShaRe\(^1\) document instead:

    • Access Control Lists manage shared write access

    • Adopted DisCo-Registration Kind to ShaRe requirements

\(^1\)draft-knauf-p2psip-share-00 (Presentation by Gabriel Hege)
Distributed Conference Control

• A Distributed Conference (**DisCo**) is a multiparty session in a tightly coupled model that is controlled by several independent entities called **Focus Peers**
Conference ID Registration – Update

- Using ShaRe definitions for variable conference identifier corresponding to a naming pattern (as RegEx)
- Update of DisCo-Registration to req. of ShaRe:

```
struct {
    opaque resource_name<0..16^1>;
    opaque user_name<0..2^16-1>;
    opaque coordinate<0..2^16-1>;
   NodeId node_id;
} DiscoRegistrationData
```

- **resource_name**: Req. of USER-PATTERN-MATCH policy
- **user_name**: Req. of USER-CHAIN-ACL policy
- **Additional**: Storage of Access List Kind
  - List of users allowed to register as focus peer
DisCo using ShaRe

• Creator of a conference stores two Kinds:
  a. DisCo-Registration: Mapping Conference ID to its Node-Id
     • Uses USER-NODE-MATCH or USER-PATTERN-MATCH
  b. Access List Kind: Initializing shared write access to DisCo Kind at this Resource-Id

• Creator may delegate write access to potential focus peers
  – Store a new ACL item delegating: creator -> pot. focus
  – Enable potential focus to register as conference controller
  – Decide on delegating write access to further parties
SDP Offer/Answer in DisCo

- Focus peers are responsible for distributing media to connected participants
- Ad-hoc scheme:
  - A Focus distributes all media streams to all connected peers
  - Focus may choose to do mixing/recoding
  - When a new peer joins:
    - Focus offers all media streams it receives to the joining peer
    - Joining peer offers its media streams to the focus
    - **Either:** Focus modifies media sessions to all connected peers, offering the new stream
    - **OR:** Mix the new stream with existing streams to prevent the need for SIP re-INVITE
- Media streams naturally follow signaling connections
Event Package for Distributed Conferences

- Design Objectives:
  - Partial ordering of events in a distributed conference
  - Convey information about roles and relations of the conference participants
  - Announce local state of the focus peers
  - Reuse of existing XML elements of the Event Package for Conference State [RFC4575] (see figure)
Coherent Versioning using a $\langle $version-vector$\rangle$

- Uses principle of vector clocks$^2$
- A $\langle $version-vector$\rangle$ of a conference with N focus peers has N $\langle $version$\rangle$ sub elements
- Each $\langle $version$\rangle$ announces the local state of a single focus peer with a counter
- A focus increments its counter if its local state changes and sends an event notification containing the entire $\langle $version-vector$\rangle$
- Allows partial ordering of concurrent change events origin-wise
  - Detects causality violations

$^2$ Fidge, C., "Timestamps in Message-Passing Systems that Preserve the Partial Ordering", in Proc. of 11$^{th}$ ACSC , pp. 56-66,Feb. 1988
Announcing the Local State using `<focus>` Element

- Aggregates state information of a conference party acting as focus peer
- A separate element for each focus
- Maps participants to focus peers
- Changes of local state updates the corresponding `<focus>` element
  - Increments logical clock of the associated `<version>` element
Interconnecting Focus Peers using the <relations> Element

• <relation> elements used to reflect the state synchronization and media flows between the focus peers
  ➢ enables reconstruction of conference topology
• <relation> elements contain a string of form:
  – “CONNECTION-TYPE:IDENTIFIER”
• Two connection types defined:
  – sync: Indicates subscription for DisCo events
    • Uses SIP call-id as identifier
  – media: Indicates a media connection to remote focus
    • Uses SDP ‘label’ to identify a single media stream
• Connection types can be extended
Next Steps

• Implementation of DisCo and ShaRe in progress

• Ready for adoption as a WG item?
Thanks for your attention!

Questions?

Alexander Knauf, Gabriel Hege, Thomas Schmidt, Matthias Wählisch
http://inet.cpt.haw-hamburg.de/