Multiparty Multimedia Session Control Working Group

68th IETF – Prague

19 March 2007

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- When starting a presentation you MUST say if:
  - There is IPR associated with your draft
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- When asking questions or commenting on a draft:
  - You MUST disclose any IPR you know of relating to the technology under discussion
- References:
  - RFC 3978 (updated by RFC 4748), and RFC 3979
  - “Note Well” text

Agenda

17:40	Introduction and progress report	(Chairs)
17:45	ICE	(Rosenberg)
18:30	ICE-lite	(Rescorla)
18:40	SDP Capability Negotiation	(Andreasen)
19:10	SDP Media Capability Negotiation	(Even)
19:20	Media decoding dependency	(Schierl)
19:25	Source-Specific Media Attributes	(Lennox)
19:35	The MSR Bandwidth modifier in SDP	(Desineni)
19:40	Media Description for IKE in SDP	(Saito)
19:45	Configuring DiffServ using SDP	(Polk)
19:50	End	

Introduction and Progress Report

Ott/Perkins/Mulé

Working Group Status

- Published
  - draft-ietf-mmusic-sdp-bfcp-03.txt → RFC 4583
  - draft-ietf-mmusic-fec-grouping-05.txt → RFC 4756
  - draft-ietf-mmusic-sdp-media-content-06.txt → RFC 4796
- With RFC Editor:
  - draft-ietf-mmusic-sdpng-trans-04.txt
    (Revised ID Needed?)
- With IESG:
  - draft-ietf-mmusic-securityprecondition-03.txt
    (Revised ID Needed per ID Tracker)

Working Group Status

- Done:
  - draft-ietf-mmusic-connectivity-precon-02.txt
    - Waiting for ICE
  - draft-ietf-mmusic-ice-14.txt?
  - draft-ietf-mmusic-sdp-capability-negotiation-reqts-01.txt?
  - draft-ietf-mmusic-sdp-capability-negotiation-05.txt?
- Dead:
  - IMG related drafts
  - RTSP/2.0?
    - Need help to finish this!
    - Three individuals expressed interest in reviewing and helping resolve open issues; review team will be formed in April 2007 with regular calls

Future Directions

- **Finish ICE, ICE-lite, and ICE-TCP!**

- Finish media capability negotiation
  - Requirements considered done
  - Base specification close to done
    - Tie in to best effort SRTP and RTPSEC BOF
  - Media negotiation draft proposes significant extensions
    - How much flexibility/complexity do we want?

- Advance other documents in wg charter
- Re-charter to consider future directions

ICE

Rosenberg

draft-ietf-mmusic-ice-14.txt

draft-ietf-mmusic-ice-tcp-03.txt

Changes since -13

- Countless organizational and wording changes to improve readability (thanks Ekr, Dan)
- Spec was inconsistent on when you include candidates
  - All but port=0?
  - All but a=inactive?
  - Now clear that its all but port=0
- Included note saying the first m-line should be most important – its checked first
- For STUN servers – if you learn them through DNS, use the same one for all queries for this session
  - Makes sure the foundations are identical – otherwise frozen algorithm is suboptimal

Changes since -13

- Added error case: if TURN query fails during gathering, revert to regular STUN
- Changed a=inactive vs. 0.0.0.0 from SHOULD to MUST
  - ICE really doesn’t work with 0.0.0.0
- Not requiring subsequent offers to contain peer-reflexive candidates that you have learned
  - Will slow down ICE if you include them and don’t otherwise want to
  - Only reason to include is some really corner topology cases identified by Philip

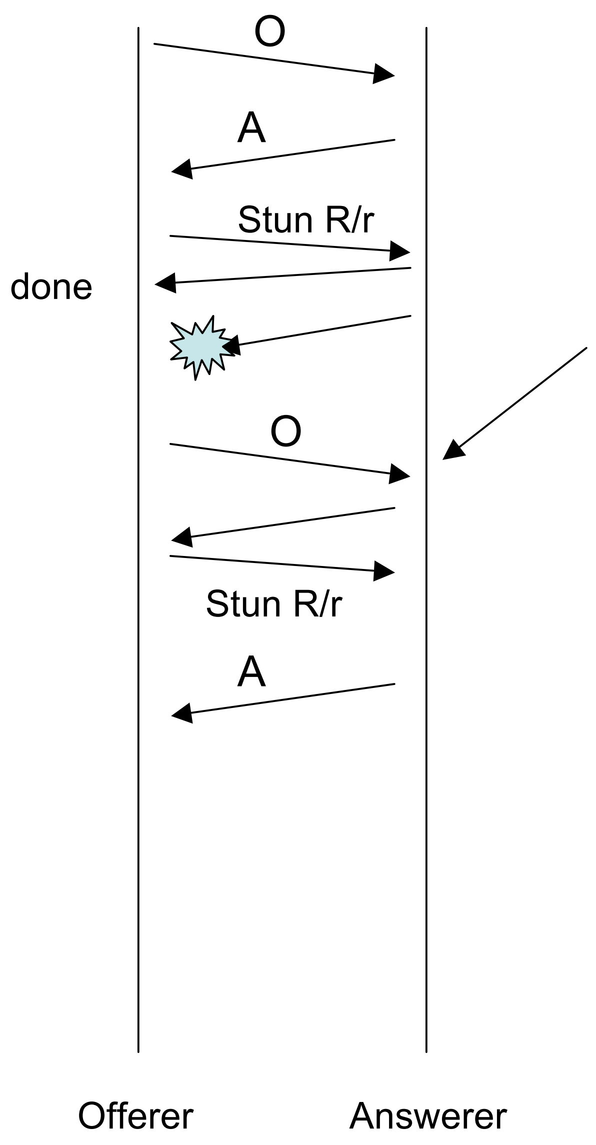
Changes since -13

- When you send an updated offer in Completed state, now you MUST only include your selected candidate pairs
  - Used to be SHOULD – but there is never a reason to send anything but
- Fixed race condition:
  - Controller sends USE-CANDIDATE, and is using the aggressive mode
  - Controlled party stops retransmitting all checks
  - Packet loss causes inconsistent view on whether a higher priority check (that had USE-CANDIDATE) succeeded
  - Fix is: only cease retransmits on lower priority pairs

Changes since -13

- If a controller uses an aggressive algorithm, once one is selected, it waits 1 second before updated offer
  - Might be transient selected pairs, gives it time to stabilize
  - Updated offer is not needed to send media, just fixup for intermediaries, so waiting as long as 1 second is fine
- Biggest change: delayed answer in remote-candidates race case

Race Flow



This arrives with an a=remote-candidates. If there is a symmetric NAT between offerer and answerer, the value in there may not yet be known to the answerer, so it cannot include a candidate attribute in the answer. This used to not matter – omit it – but now we require a match of candidates and m/c-line to deal with SBC. So answerer needs to delay answer till check completes. Note this has no impact on media delays.

Changes since -13

- Added text hinting how RTP/RTCP mux would work
- Documented how ICE and ANAT work together

Recent Bug not Addressed in -14

- ICE assumes you always have one agent as controller, one as controlled
- This is true for ‘normal’ cases and for the four 3pcc flows in RFC 3725
- However, there are 3pcc and application flows that end up with:
  - Both ends thinking they are controller
  - Both ends thinking they are controlled
- ICE will currently fail badly in both cases
  - In the former, disagreement on selected candidates and glared invites
  - In the latter, non-conclusion on ICE

Fortunately, fix is easy

- For both agents as controller
  - If a controlling agent gets a USE-CANDIDATE in a STUN request it receives, we’ve detected this
  - Solution is: reject request and make controller/controlled decision based on tie-breaker (largest ufrag wins controller role). Proceed.
- For both agents as controlled
  - Checks will complete and there is never a USE-CANDIDATE
  - Solution is: 500ms after completion of all checks, if you don’t get a use-candidate, make a tie-breaker decision as above. Proceed.

ANAT

- There is definite overlap between ICE and ANAT, and also SDP capability negotiation
- ICE Alone
  - For each media stream include v4 and v6 candidates
  - Prioritize them as needed (v6 first, then v4)
  - Can include multiple v6 candidates
  - Selection will be based on priority and connectivity
  - In cases where v6 path is broken, will fall back to v4
  - Requires a re-invite to ‘fix-up’ SDP if v6 is selected and v4 was in m/c-line
  - Can use custom selection algorithms to take delay into consideration also
- ANAT Alone
  - Include two m-lines and a Require header in INVITE
  - Select v6 if other side is v6-capable, else v4
  - Reinvite needed if remote side doesn’t support ANAT

ANAT

- ICE+ANAT
  - Include two m-lines, one for v4, one for v6
  - V4 m-line includes v4 candidates
  - V6 m-line includes v6 candidates
  - Choose highest priority v6 candidate if one works, else highest priority v4 candidate
  - Re-invite required if remote side doesn’t support ANAT, and also if selected candidate doesn’t match m/c lines
- SDP Cap negotiation
  - Include v6 IP address as a high priority capability
  - Will be similar to ANAT but better in that it allows for graceful fallback without a Require header field
- SDP Cap Negotiation + ICE?
  - Could use ICE to drive connectivity-based selection of potential configs
  - But this is really complicated – no clear need

ANAT

- Question:
  - What is our recommendation for dual-stack hosts to do v4/v6 selection?
    - ANAT alone
    - ICE alone, deprecate ANAT
    - ICE+ANAT
    - SDP Caps, deprecate ANAT
  - Where is this recommendation documented?
- Proposal
  - Transport address selection is always better dynamically than statically
  - Have ICE obsolete ANAT, remove section on ANAT interaction
    - Note that no other changes are required – ICE always allowed for multi-address candidates
  - Document v4/v6 application in the SIPPING transition document

ICE-lite

- Need to make sure we are happy with the way ICE and ICE-lite relate
- My view is:
  - All normative text for supporting ICE-lite is in ICE, it cannot be separate
  - ICE-lite spec serves as an informational document to assist ICE-lite implementors find what parts of ICE they need to read by explaining things and pointing into ICE

ICE-TCP

- Major changes in this draft
- Removed TLS entirely
  - ICE is about transport connections
  - Whether a TCP connection is used for TLS or not is signaled in m-line
  - If you want to negotiate TCP or TLS use our new capability negotiation draft, not ICE
- ICE-TCP requires a full implementation of ICE, not lite
- If default is UDP, and a TCP candidate is meant as a TLS alternate, include fingerprint attribute
- If a TCP candidate is for TLS, the fingerprint attribute is present in the initial offer
  - This allows you to verify fingerprints immediately
  - Previous spec only did this in re-invite – introducing clipping for TLS. No longer

ICE-TCP

- Previously, from each simultaneous-open and passive local candidate, you'd obtain a relayed candidate
  - Unclear whether relayed candidates were s-o or passive
  - And uneccesary to obtain relayed from BOTH s-o and passive local – both have same bases
  - So, fixed this
- Relationship to comedia now clear
  - Comedia attributes included only when default candidate is tcp, to allow backwards compatibility with non-ICE peers
  - Comedia is not used in any way with ICE itself
- Regular selection (not aggressive) is required for TCP candidates

ICE-TCP

- ICE restart interaction with connection management is clarified
  - Keep selected connection open
  - Redo checks
  - If previous connection is re-selected, continue using, else close
- Connection management overall clarified
  - Can close a connection at any time – just reopen and reuse without ICE checks
    - Bug in the spec, I think – what if connection creates new IP/ports. Perhaps we need STUN?
  - If connection cannot be reopened, do a manual restart of ICE

ICE-TCP Issues

- Issue #1: If S-O TCP is used with TLS, who sends ClientHello?
- Choices
  - Define new tls-act/pass/actpass attribute like comedia’s
    - But applies only to TLS
  - Controlling agent always sends
    - Won’t work in cases where one end is a gateway or other device that has a cert, and other side doesn’t
  - Reuse comedias attributes
    - Semantics are subtely different though
- Proposal
  - Define new attributes and add to ice-tcp

ICE-tcp Issues

- Issue #2: Can we use session resumption with TLS when connections close, and if so, how to signal?
- Answer:
  - Apparently yes, without any documentation
  - Proposal: just remove open issue text, add a comment that resumption will get used

Plan of Action

- Issue ICE-15 with
  - List comments on -14 (all minor)
  - Bug fix for controller/controlling mismatches
  - ANAT resolution
- ICE-15 gets issued this week or some dire punishment gets laid on me by the group
  - Removal as editor
  - Banned from submitting new drafts
  - Owe Colin/Joerg/J-F an expensive bottle of wine
  - Etc.
- ICE-tcp update shortly. Are we ready for WGLC?
- Issue WGLC on ICE-15 immediately upon issuance
  - And a request to group: Please do not nitpick this draft to death with WGLC comments
  - It has had an amazing amount of review and revision already, it needs to be finished more than anything else

ICE-lite

Rescorla

draft-rescorla-mmusic-ice-lite-00.txt

draft-rescorla-mmusic-ice-lite-00

- In San Diego we agreed we would do an “ice for gateways”
- Assumptions:
  - You have a public IP address
  - You don’t want to bother with timers, check lists, etc.
  - But you do want to do ICE
- You also don’t want to bother reading the entire ICE spec
- This document attempts to fill that need

Overall strategy

- Provide an overview of how ICE-lite works
- For each feature:
  - Provide an overview of the ICE-lite behaviors
  - Reference the specific ICE sections you need to implement
    - This means the document does not stand alone
- Open issues
  - Should we provide complete descriptions so you don’t have to read ICE at all?
  - Should this be the normative description of ICE-lite or is that in ICE?

SDP Capability Negotiation

Andreasen

draft-ietf-mmusic-sdp-capability-negotiation-05.txt
draft-ietf-mmusic-sdp-capability-negotiation-reqts-01

IPR Statement

- Cisco is the owner of one or more pending unpublished patent applications relating to the subject matter of "SDP Capability Negotiation" <draft-ietf-mmusic-sdp-capability-negotiation-05.txt>.
  - See https://datatracker.ietf.org/public/ipr_detail_show.cgi?&ipr_id=761
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Since Last IETF

- Formed Design Team consisting of
  - Roni Even, Robert Gilman, Matt Lepinski, Joerg Ott, Colin Perkins, Thomas Stach, and Flemming Andreasen
- Additional input and feedback from
  - Francois Audet, John Elwell, Cullen Jennings, and Dan Wing
- Weekly conference calls from 12/12/06 to 2/27/07
  - Adopted <draft-andreasen-mmusic-sdp-capability-negotiation-01.txt> as starting point
  - Split document in two
    - Requirements: Initial design team focus
    - Solution document: Based on requirements document

Documents

- Requirements
  - draft-ietf-mmusic-sdp-capability-negotiation-reqts-01.txt
  - Main guiding principles
    - Provide a general purpose capability negotiation mechanism
    - Avoid undue complexity or scope creep for people that need only negotiation of transport protocols and associated attributes
  - Stabilized pretty quickly; divided requirements into
    - Core: All implementations must support
    - Extensions: Optional to implement
  - Ended up moving media requirements to "extensions" in order to have a small and focused "core"
    - More rapid progress towards mature solution
- Ended up with two solution documents per the above
  - SDP Capability Negotiation
    - draft-ietf-mmusic-sdp-capability-negotiation-05.txt
    - This is the "core" document
  - SDP Media Capabilities Negotiation:
    - draft-ietf-mmusic-sdp-media-capabilities-01.txt
    - An "extension" document

SDP Capability Negotiation (Core)

- Provides capabilities for the following
  - Attributes
  - Transport protocols
- Allows for those capabilities to be used in SDP Capability Negotiation
  - Potential Configurations provided in offer SDP
    - Each potential configuration references one or more capabilities
  - Answerer may pick one of the potential configurations from the offer and negotiate use of it as the actual configuration
    - Actual configuration chosen indicated in answer SDP
- Extensions supported via option-tags that can be required or just listed as supported

Open Issues in Core

- There aren’t any known open issues in the spec per-se, but the following is worth discussing
  - Add, replace, delete semantics for attributes
  - Inconsistent media-level selection of session-level capabilities

Background Information

- Conceptually, potential configurations are formed by purely syntactical operations on an offer SDP:
  - For each potential configuration, create a "potential configuration SDP" consisting of
    1. The original SDP
    2. For transport protocol capabilities included, <u>replace</u> the transport protocol (e.g. "RTP/SAVP") in the "m=" lines
    3. For attribute capabilities included, <u>add</u> the attributes to the original SDP
  - Use this potential configuration SDP as the potential offer

<u>Actual Configuration SDP</u>

```
v=0
o=- 25678 753849 IN IP4 192.0.2.1
s=
c=IN IP4 192.0.2.1
t=0 0
m=audio 53456 RTP/AVP 0 18
a=tcap:1 RTP/SAVP RTP/AVP
a=acap:1 a=crypto:1 AES_CM_...
a=pcfg:1 t=1 a=1
```

<u>Potential Configuration SDP</u>

```
v=0
o=- 25678 753849 IN IP4 192.0.2.1
s=
c=IN IP4 192.0.2.1
t=0 0
m=audio 53456 RTP/SAVP 0 18
a=crypto:1 AES_CM_...
```

To Add, Replace or Delete Attributes

- Problem with just adding attributes
  - There may be attributes in the potential configuration SDP that redefine an existing attribute value
    - Example: An “a=rtpmap” that assigns a different codec to a given payload type
  - There may be attributes in the potential configuration SDP that contradict the added ones
    - Example: Direction attributes (“sendonly” and “sendrecv”)
  - There may be attributes in the potential configuration SDP that overlap the added ones
    - Example: key-mgmt and crypto attributes (use only one)
  - There may be attributes in the actual configuration SDP that you don’t want in a particular potential configuration SDP
    - Example: ICE candidates when you select a transport protocol that you do not want to run over UDP or TCP (e.g. T.38 over TCP versus PCMU over RTP)
- We do not want the SDP Capability Negotiation layer to try and sort these out
  - SDP Capability Negotiation would need to be aware of all SDP attribute, etc. semantics
  - Extensibility (e.g. new attributes) would be problematic

To Add, Replace, or Delete Attributes

```
v=0
o=- 25678 753849 IN IP4 192.0.2.1
s=
t=0 0
c=IN IP4 192.0.2.1
a=key-mgmt:mikey AQAFgM0XflA...
a=acap:1 a=key-mgmt
a=tcap:1 RTP/SAVP RTP/AVP RTP/AVPF
m=audio 59000 RTP/SAVP 98
a=rtpmap:98 AMR/8000
a=candidate:1 1 UDP 2130706178
a=candidate:2 1 UDP 1694498562
a=candidate:3 1 tcp-act 1706178213
a=acap:2 a=crypto:1 AES_CM_128_...
a=pcfg:1 t=1 a=-1,2
a=pcfg:2 t=2 a=-1
a=...
```

If RTP, then don't want

If SRTP, then don't want both

If RTP/AVPF, then don't want ice-tcp

Or, don't use FEC or RTP retransmission if ice-tcp

To Add, Replace or Delete Attributes

- Solution 1
  - Keep existing attributes and establish rules for how to deal with attributes added. For example:
    - Add all attributes at the beginning
    - For existing well-known attributes, specify rules that say to ignore subsequent attributes that redefine or contradict an existing value (e.g. rtpmap, fmtp, sendonly/recvonly)
    - Keep your fingers crossed for the rest
  - Pros:
    - Little text in spec (i.e. it looks simple)
    - Appealing if all you care about is a limited well-known problem
  - Cons:
    - Fuzzy semantics once we get into extensions (interoperability problem)
    - Does not address all well-known problems (e.g. key-mgmt versus crypto)

To Add, Replace or Delete Attributes

- Solution 2
  - Delete all attributes from the actual configuration SDP
  - Require the potential configuration SDP to add all necessary attributes
  - Pros
    - Clean semantics
    - Easy to understand and implement
  - Cons
    - All actual configuration attributes of relevance to a potential configuration will have to be duplicated as attribute capabilities
      - Message size concern, e.g. consider keying material, ICE candidates, etc.
      - Not clear we can always reconstruct the SDP we actually want
        - » Consider grouping framework which spans both the session and media-level
      - Magnus' 10k SDP ("How big can SDP get", MMUSIC, 5/17/06)

To Add, Replace or Delete Attributes

- Solution 3
  - Keep existing attributes
  - Provide mechanisms to remove one or more of the existing attributes
    - This is what is specified in the current solution
      - Allows all attributes at session and/or media level to be removed
      - Allows attributes with a particular name to be removed
  - Pros
    - Clean semantics
    - Provides decent message size efficiency
    - Addresses well-known problems and provides for extensibility
  - Cons
    - Probably not that simple to understand and use
      - Implementer has to know what he is doing
      - Currently specified mechanism effectively allows fallback to solution 2 though

To Add, Replace or Delete Attributes

- Recommendation
  - Solution 3
    - Is current specification for this adequate ?
    - Should we extend DELETE/REPLACE to
      - Have specific rules for rtpmap and fmtp parameters (include payload type or media format ?)
        - » Would allow for more efficient replacement of those values
      - Allow for string-based matching of attribute name and value as opposed to just attribute name
        - » Would allow for more targeted deletion and/or replacement of attributes

Inconsistent media-level selection of session-level capabilities

- Attribute capabilities can be present for the session-level and media-level
- Potential configurations are present at the media-level
  - The potential configuration applies to that media description
  - Can select media-level attribute capabilities
  - Can select session-level attribute capabilities
    - In case of two different media descriptions, each media description may select different session-level attributes.
    - It is possible, that inconsistent (or conflicting) session-level attributes could be selected as a result of that

Inconsistent media-level selection of session-level capabilities

- Possible solutions
  1. Disallow use of session-level attribute capabilities
     - Significant restriction
     - Would not enable session-level key-mgmt, diffie-hellman, etc.
  2. Add warning text in draft and encourage use of media-level attribute capabilities only, whenever possible
     - Clearly, there will still be room for errors here
  3. Add a mechanism to be able to specify attribute capabilities that are mutually exclusive (constraints)
     - More complexity
     - Still seems to address only a subset of the general problem
       - Constraints on combinations of multiple attributes and/or possibly related to other capabilities (e.g. transport)
       - Constraints between media descriptions

SDP Capability Negotiation

- Next Steps
  - We have a solution that satisfies the requirements at this point
  - Issue update addressing the comments raised on the list
    - Are we then ready for WGLC ?

SDP Media Capability Negotiation

Even

draft-ietf-mmusic-sdp-media-capabilities-01.txt

Media Capabilities

- Extends the base capabilities negotiation for RTP based media
- Codec definition can be very complicated
  - Simple media codec
  - Redundancy codecs (like FEC)
  - Composite like layered codecs
- Work is trying not to cover every combination (not H.245)

Solution model

- Unique codec numbers at session level
- Configuration parameters for rtpmap and fmtp associated with one or more codec numbers
- Map on the media level the codec numbers to RTP payload types assigning parameters from the configuration parameters.

Extends capability negotiation - example

- Adds media negotiation attributes

```
a=creq:v1
a=cmed:1 audio AMR AMR PCMU AMR
a=cmed:5 video H263
a=cenc:1,2 8000/1
a=cenc:4 16000/1
a=cfmt:1,4 max-red=220
a=cfmt:2,4 octet-align=1
a=lcfg:1 m=5
m=audio 3456 RTP/AVP 0 97
a=rtpmap:97 AMR/16000/1
a=fmtp:97 mode-change-capability=2; max-red=220
a=pcfg:1 m=1|2 pt=1:100,2:101
a=pcfg:2 m=3|4 pt=3:102,4:103
```

Open issues

- The work extends the basic capability negotiation whose full scope is not finalized.
- Address RTP based media – is this enough
- Final format is still open to suggestion – please review

Media Decoding Dependency

Schierl

draft-schierl-mmusic-layered-codec-03.txt

draft version 01, 02: Changes

- Extended and more precise definition and use-case sect.
- Extended section on Offer/Answer, declarative usage
- Removed SSRC mux in -02, also removed from (related) draft on RTP Payload for SVC – draft-ietf-avt-rtp-svc-01
- Original SSRC mux use-case for SVC:
  Adaptation of encrypted and authenticated content without being in the security context.
- Found out: Is not possible, since RTCP feedback is also authenticated within SRTP
- That means: Not possible to cover full SRTP functionality
- Remaining use-case:
  Adaptation of media stream without parsing Payload header in strongly restricted use-cases

Open issues/TBD:

- Should we re-think the SSRC discussion? See next presentation: draft-lennox-mmusic-sdp-source-attributes-00
- TBD: Capability Negotiation interaction/issues
- Planned: Integration of mechanism proposed in draft-schmidt-mmusic-media-dependency-00 indicating relations between medias of different types, e.g. subtitling text stream for a video stream

- I like to ask for working group status, since basic mechanism (SDP dependency grouping + dependency attrib.) seems to be stable

Source-Specific Media Attributes

Lennox

draft-lennox-mmusic-sdp-source-attributes-00.txt

Source-Specific Attributes: Review

- RTP allows multiple sources in an RTP session, but SDP has no way to signal this.
- Solution: define an SDP attribute for characteristics of a source.

```
m=video 49170 RTP/AVP 96
a=rtpmap:96 H264/90000
a=ssrc:12345 cname:user@example.com
a=ssrc:12345 information:Main camera
a=ssrc:67890 cname:user@example.com
a=ssrc:67890 information:Alternate camera
```

- Map SDP “source-specific” attributes into the `ssrc` attribute.
- This generalizes material that was previously in the RTP Single-Source Multicast draft.

Motivation

- Avoid clashes with the SSRC id of a single media sender.
  - This is needed for Single-Source Multicast.
- Make SSRC multiplexing explicit.
  - Describe, and differentiate between, multiple SSRCs from the same participant in the same RTP session.
  - Examples:
    - Multiple cameras
    - FEC
    - Retransmission
    - Layered codecs

Open Issues

- What does this mean for RTP collision detection?
  - Discussed in AVT.
- What source-specific attributes should be defined?
  - Define as needed: don’t inherit blindly from media level
- Should it be possible to select individual sources with offer/answer?
- IANA registration issues
  - Some media-level parameters (group semantics, bwtypes) are re-used at the source level.
  - Do they need a separate IANA registry?

Open Issues 2

- MIKEY (RFC 3830, signaled in SDP with RFC 4567) also specifies SSRCs in SDP.
  - Proposal: if you use both, they MUST be consistent.
  - Does more need to be said?
- Needs to work with capability negotiation.
  - Negotiate capabilities of a source, or negotiate sources?
- Backward compatibility.
- Need to clarify this isn’t for combining different media types.
  - Don’t multiplex audio and video.
  - One payload type number space.

Next Steps

- How much of this do we need?
  - declaration/identification of an SSRC vs. further qualification/negotiation.
- Need to move quickly on the base spec (RTCP-SSM dependency).
- Should this be a working group item of MMUSIC?

The MSR Bandwidth Modifier

Dondeti

draft-hdesinen-mmusic-oa-send-bw-attr-02.txt

Offer/answer for optimized asymmetric reservation

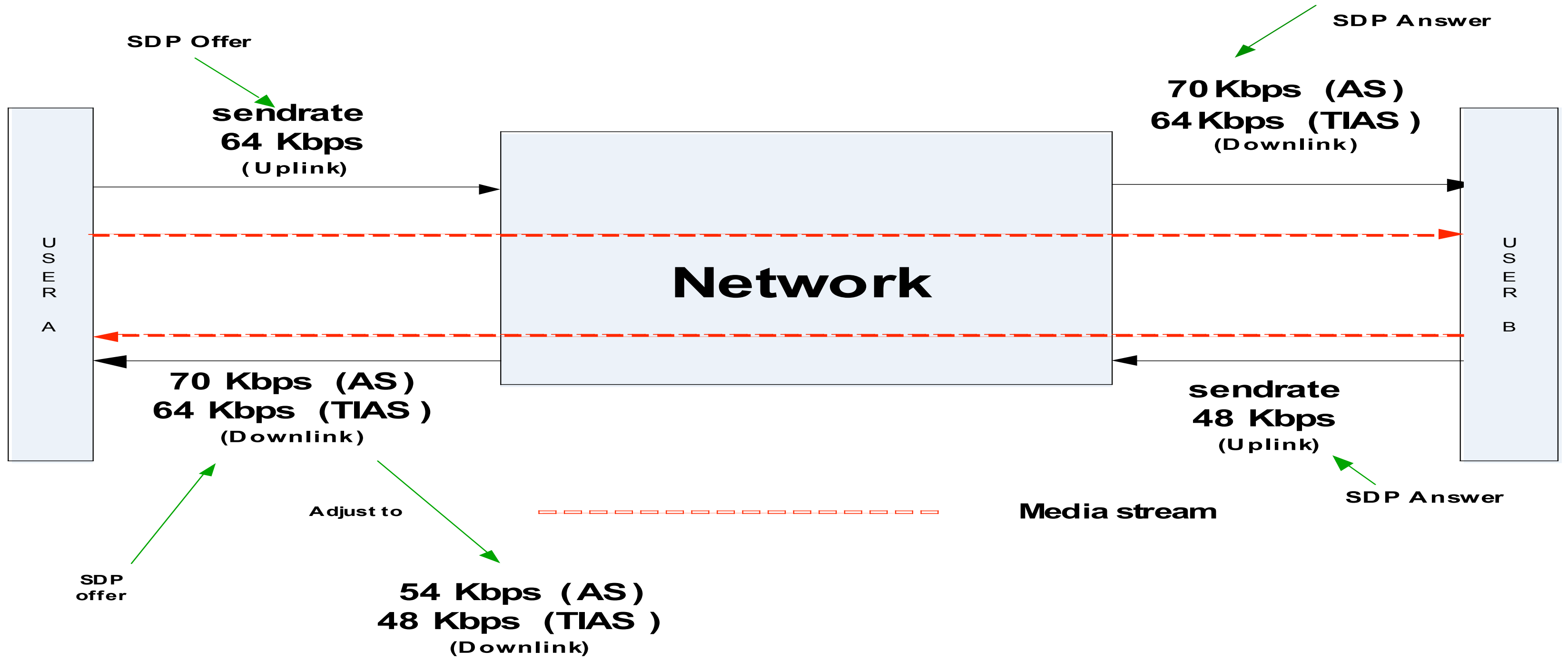
- Offer from A

m=video 34234 RTP/AVP 96	
a=AS:70 (Kbps)	(A ← B)
a=TIAS:64000 (bps)	(A←B)
a=maxprate:20	(A ←B)
b= MSR:64000	(A→B)

- Answer from B

m=video <>	
a=AS:70	(A → B)
a=TIAS:64000	(A → B)
a=maxprate:20	(A ←B)
b= MSR:48000	(B→A)

[Note: Text in the parenthesis is for information purpose only. It is not part of the actual signaling]



We need a bandwidth modifier in ‘send’ direction to signal the asymmetric bitrates of a bi-directional (‘sendrecv’) stream. This is also useful to signal the max bitrate of a ‘sendonly’ stream.

Is it sensible to use MSR bandwidth modifier for the above?

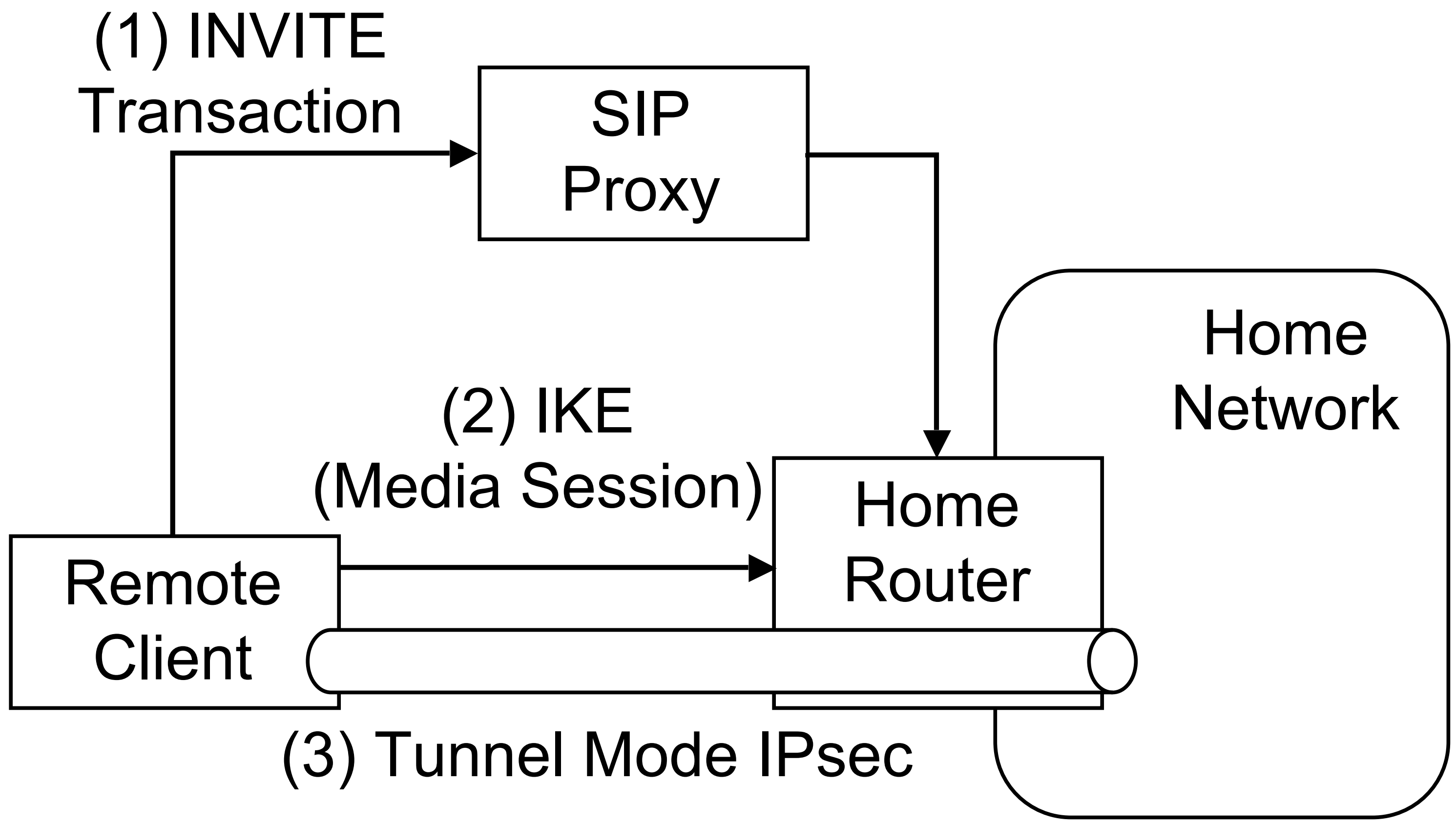
Media Description for IKE in SDP

Saito

draft-saito-mmusic-sdp-ike-00.txt

Purpose

- Setting up IPsec (IKE) Using SIP
  - VPN to a home router (or NAT device), etc.



Proposals

- Exchanging Fingerprint of Self-Signed Certificate for IKE Authentication
  - Same Concept as Comedia-tls (RFC4572)
- New Media Format Description “IKE”
  - m=application 500 UDP IKE
- New Attribute “udp-setup”
  - Similar to Comedia (RFC4145)

a=udp-setup:active	(IKE Initiator)
a=udp-setup:passive	(IKE Responder)

Configuring DiffServ using SDP

Polk

draft-polk-mmusic-dscp-attribute-01.txt

Summary

- Media Level Attribute
- For granularity of each stream within an offer/answer
- To be set by offerer or server in signaling path (in offer and in answer)
- Example:

```
v=0
o=alice 2890844526 2890844526 IN IP4 atlanta.com
c=IN IP4 10.1.3.33
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=dscp 46
m=video 51172 RTP/AVP 31 34
a=rtpmap:31 H.261/90000
a=rtpmap:34 H.263/90000
a=dscp 41
```

Changes in -01

1. Allow offerer to include “a=“ line per stream without a value to indicate support for extension
2. Allow offerer to include dscp value to indicate which dscp of a multi-dscp plan a user happens to want for each stream (a gold/silver/bronze service)
3. Added a “/dscp-value” to the attribute per stream to be able to set RTCP dscp value too

    ‘a=dscp 46/11’ or ‘a=dscp 46 11’

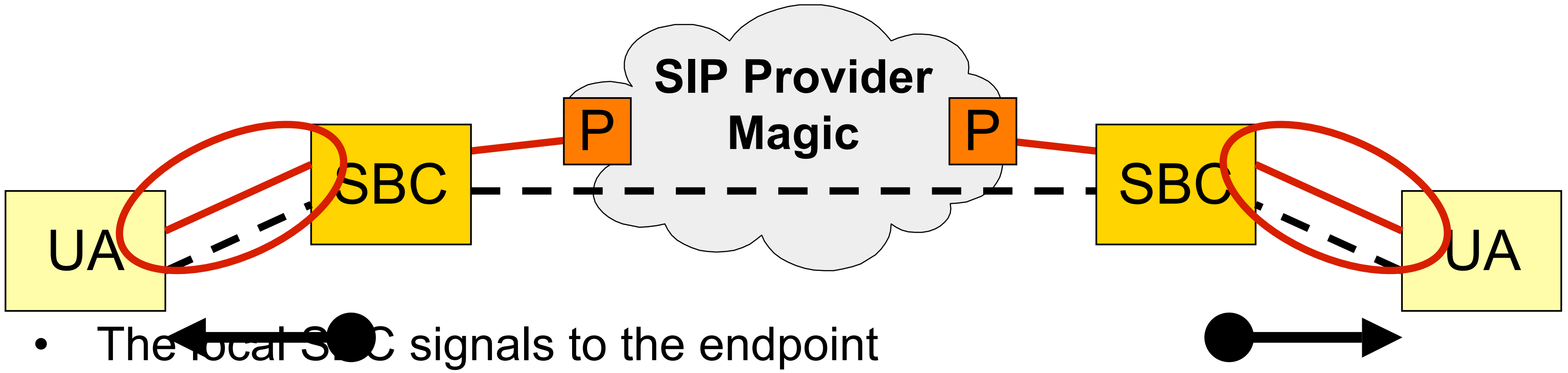
4. Added TSVWG item ‘EF DSCP for Capacity Admitted Traffic’ ID as requirement here
5. Cleaned up some text

Remaining Open Issue

- Should there be a direction indication (send, recv, sendrecv)?
  - Will need use cases if wanted
- Is there sufficient interest in this to make it a WG item?

General observations…

- This is some kind of middle-to-end signaling



- The local SBC signals to the endpoint
  - The rest of the SDP is more of less e2e though
  - Breaks end-to-end security
  - If we want to get something e2e at some point, will every have to implement both?
  - Feature interaction between multiple SBCs (who is the last hop)?
- Is this the first out of many things to come?
- What is the appropriate mechanism?
  - SDP signaling path? Media path? Some other signaling?