SDP Connectivity Capability (CCAP) Attribute

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The Problem

• ANAT is broken
  – Doesn’t work with legacy IPv4 hosts
• ICE is heavy, rare, and there won’t be a flag day to make all hosts speak ICE
• There are millions of legacy IPv4 SIP UA’s
• IPv4 addresses are running out…
The SIPv6 Transition Problem

- The setup: UA-1 is a legacy IPv4 SIP UA, UA-2 is a new IPv6-only UA
- The problem: How does UA-1 talk to UA-2?

Diagram:
- IPv4 UA-1 sends an INVITE to a Proxy
- The Proxy forwards the INVITE to IPv6 UA-2
The SIPv6 Transition Solution-1

- Possible answer 1: UA-2 is dual-stack, ICE capable
  - Not really dual-stack, but possibly borrows a addr:port set
  - If it were really dual-stack, we wouldn’t need IPv6
- So UA-2 does ICE using dual-address sets
  - Except, of course, UA-1 doesn’t do ICE
Possible answer 2: UA-2 uses a TURN relay, no ICE
- Similar to borrowing an IPv4 addr:port set
So UA-2 can offer both addresses with TURN
- How does it offer both v4/v6 addresses in SDP?
- Since it doesn’t know the call is going to IPv4, does it have to allocate TURN v4 relays forever?
• Possible answer 3: an SBE/DBE exists
  – SBC, P-CSCF/BGF, IBCF/BGF, “ALG”
• How it works
  – UA-2 offers IPv6
  – SBE/DBE changes it based on destination
  – UA-1 sees IPv4
  – DBE does v4-v6 interworking
(one) Real World Example

• How can we make this work/happen?
Problem Re-visited

• An SBE/DBE selecting media transport based on signaling transport works, but…
  – Media is always relayed, can never be end-to-end

• Help us help you…
  – SBE/DBE would like to offer both addresses
  – Leave the “common” one alone, add the other one
The Proposed Solution: ccap

- UA (or SBE/DBE) adds SDP ccap attributes of alternate address:port for media
  - Sets c/m lines to be the “Default” ones, in case far-end doesn’t do ccap

- Example:

```
o=- 25678 753849 IN IP4 192.0.2.1
c=IN IP4 192.0.2.1
m=audio 12340 RTP/AVP 0 8
a=ccap:1 IP6 2001:db8::1 45678
a=ccap:2 IP4 192.0.2.1 12340
```

- Base/default c/m addr:port also put into ccap
- Prioritized, based on preference
- SDP answer does NOT have ccap attributes
  - c/m-lines in answer are definitive
Interaction with other mechanisms

• Ccap does not depend on sdp-cap-neg
  – Sdp-cap-neg does not have c-line support
  – It *does* have m-line port number support
  – Proposed resolution: If conflict, sdp-cap-neg wins

• Ccap is orthogonal to ICE
  – UA can offer both
  – If both received in offer, ICE wins (if supported)
Related Work

- draft-garcia-mmusic-sdp-misc-cap-00
- Very similar concept (and same attribute name!)
- But, Boucadair-draft:
  - Does not tie ccap to sdp-cap-neg
  - Assumes different address also means different port
  - Ccap only at media level
  - Only for ccap, not other capabilities
ICE Attributes?

• Question: could we use “candidate” lines, without using ICE

• Our position: mixes oil and water
  – This isn’t even ICE-Lite, but even if it were: two ICE-Lite ends currently ignore ICE attributes
  – Legacy ICE UA’s receiving offer won’t know about this non-ICE thing, will assume ICE support
  – Will get messy, as middleboxes currently either ignore or remove ICE attributes
Benefits

• Simple
• Lightweight
• Backwards-compatible (“best-effort”)
• Submissive to ICE and sdp-cap-neg
• Enables IPv6 transition, where the starting point is legacy IPv4 UA’s without ICE
• Works with evil middleboxes
Connectivity Checks

• What if IPv6 doesn’t work?
  – What if it fails during the session?

• Our view: that’s a general problem for SDP-provided addresses, and this draft is not dependent on it
  – Solve generically elsewhere

• Ways to solve it: RTCP keepalives (which would be used during the entire session)
Open Issues

• Draft only offers 2 ccap’s per media session
  – One for v4, one for v6
• Port number is bound to IP
  – Should it be left alone in m-line? (assumes it can always be the same port – not realistic)
• Doesn’t discuss subsequent offers mid-session
  – Say anything?
• SDP answer does NOT include ccap (c/m-lines are definitive)
  – OK?
Discussion
Tag, you’re it

• Currently, draft defines an option tag for Supported header
  – Probably not necessary, and we plan to remove

• Draft-boucadair-atypes defines a media-feature-tag, of which media IP families the UA supports
  – Lets UA Register that it can do v4/v6/both
  – Plan to move that into this draft in place of option-tag