# Issues for Session Invitation Protocols

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# Overview

- session description
- ISDN and POTS integration
- implementation issues

# Session Description

- separation of addressing and session $\leftrightarrow$ envelope/header/body (mail) or request/header/body (WWW)
- session description: media + timing
- allow different SDPs without changing infrastructure
- SDP ad hoc, not extensible, positional arguments, no generic parser, line wrapping, ...
- richer session semantics:
  - grouping: equivalent channels (French, English, ...)
  - sessions with different media active times

# SDPng (1) – MIME-like

MIME-like ➠ well-known, built generic parser, but only single nesting level:

```
Media: default; transport=rtp; ttl=127,
  audio/pcmu; addr=224.2.0.1/3456/127; ptime=20,
  video/jpeg; addr=224.2.3.4/4123; q=50;
  application/wb; addr=224.3.4.5/5678; portrait
```

# SDPng (2) – LISPish

Lisp-like ➠ easy to parse, richer structures

```
(media
  (default (transport rtp) (start 19960613T1602))
  (13838a5 audio
    (pcmu 224.2.0.1 2 (ptime 20) (ttl 32))
    (lpc  224.2.0.1 2 (ptime 80) (ttl 127))
  )
  (2da85 video
    (jpeg 224.3.4.5 3 (q 50))
  )
```

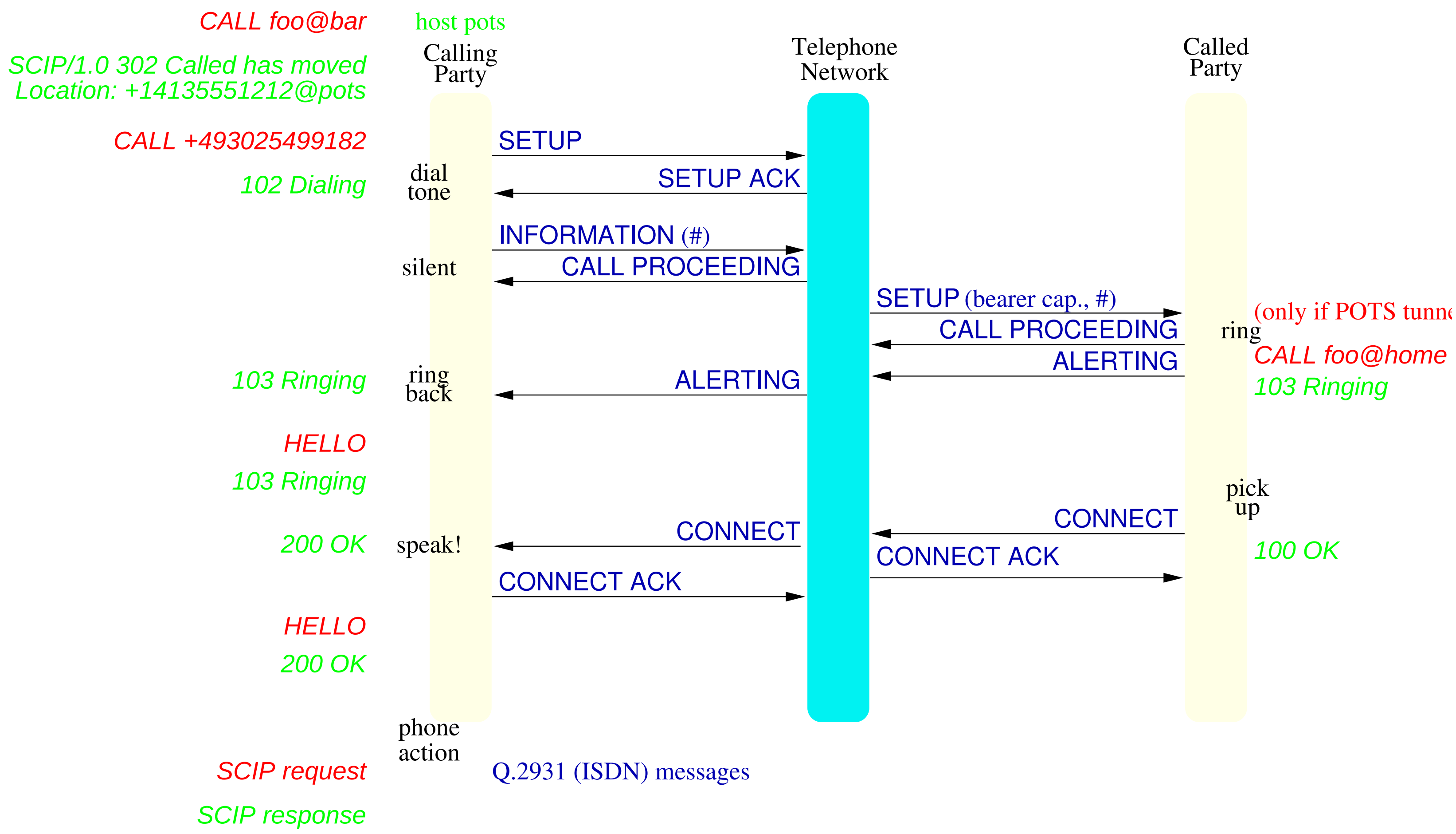
# Notes

- want media id for negotiation, partial tear-down ➠ may have several media of same type
- different ttl for different media ➠ announcement reachability $\neq$ media reachability (unpredictable)

# ISDN and POTS

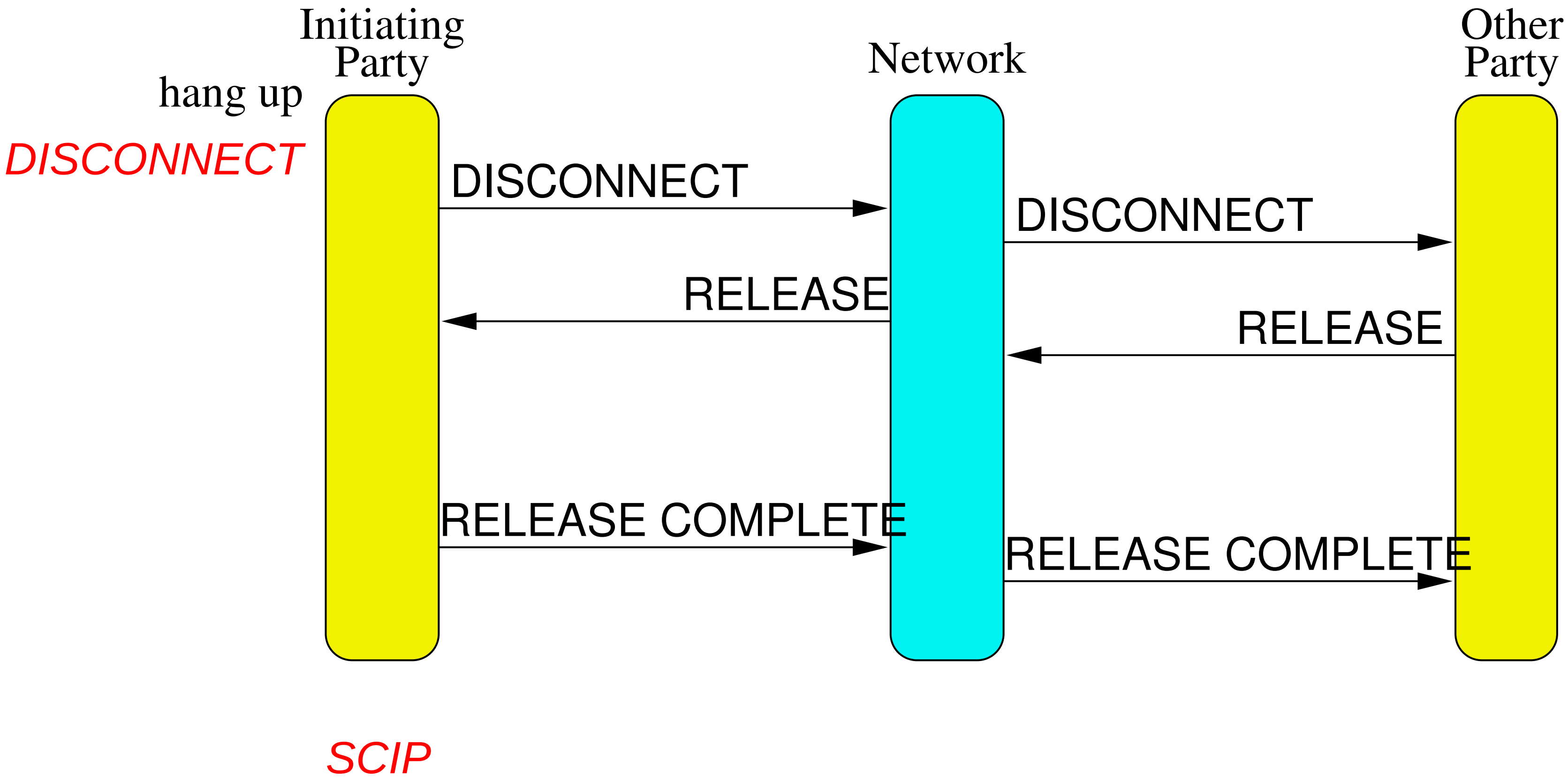
- UCI has E.164 addresses
- scenarios:
  - (office) LAN with ISDN gateway to outside world ➠ next-generation PBX
  - gateway into local phone system (tail-end hop off)
  - POTS tunnel: Internet – ISDN – Internet
  - ISDN/POTS bridged into multicast conference

# ISDN Call Setup




(Kessler, ISDN)

# ISDN Call Termination




- fault recovery ➠ need explicit teardown facility
- may need to be different from call originator

# ISDN Experience

- Sun ISDN board interface using SunShine, NeVoT engine
- need some additional requests and status messages
- likely use SSL for access authentication

# ISDN Liveness Indication

- meter is ticking ➠ need to drop ISDN connection as quickly as possible
- even if host dies or hangs
- TCP keepalive (2 hours), timeout (9 minutes) too long
- could use SCIP-level heartbeat or HELLO
- easier: use RTP data flows and RTCP for liveness indication, but across all members (“fate sharing”)

# State Issues

- mechanism works (more or less) the same for TCP or UDP
- identify call by connection (TCP) or handle (UDP)
- UDP:
  - no more than $\approx$ one second delay in status reports (ringing, busy, etc.)
  - $+$: packet boundaries, flexible retransmit timer, multicast
  - $-$: duplicate RTT estimation, reliability
  - if call request repeated: force requests to be the same
- TCP simplifies security (handshake once, rather than PGP mode)

# ISDN Issues

- choice of gateway (use @host as hint?)
- *The number you have dialed...*
- call holding, in-call transfer, add ISDN party?
- separate topic: interworking H.323